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A SURVEY OF BLOOD TRANSFUSION IN AMERICA

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The occasion of the second International Congress for Blood Transfusion (Paris, September 1937) served as a stimulus for inquiry into the present status of blood transfusion in America. It was planned to obtain the necessary information through a questionnaire to be circulated among all hospitals approved for internship by the American Medical Association. Accordingly, the board of medical control of the Blood Transfusion Betterment Association of New York City authorized the following questionnaire, which was mailed to about 700 hospitals, 350 of which responded:

1. Blood group classification; check terminology employed:
   International (O, A, B, AB).
   Jansky (I, II, III, IV).
   Moss (IV, II, III, I).
2. Number of transfusions performed in 1935....; in 1936....?
3. Method of transfusion, indicate the technic employed:
   Citrate method.
   Lindeman method.
   Paraffin method.
   Syringe-valve method:
   { Specify instrument employed: } Unger
   { insert name of instrument if other than listed } Brines, Scannel
4. Who performs the transfusions at your hospital?
   House staff { resident. / interns.
   Surgical staff.
   Laboratory staff.
   Transfusion team.
   Open to all members of hospital staff.
   If transfusions are performed by house staff, is there any supervision? By whom?
5. Donors:
   (*a*) Is a donor agency maintained by:
      (1) Your hospital?
      (2) Your county or state medical society?
      (3) A nonprofit organization similar to the Blood Transfusion Betterment Association of New York City?
   (*b*) Is a commercial donor registry available?
   (*c*) Are donors supplied gratis for indigents, if family donors are not available?
   (*d*) What is the cost of blood per hundred cubic centimeters?
   (*e*) How often are Wassermann, Kahn or Kline tests repeated on donors?
   (*f*) Is a test for syphilis done just prior to the transfusion?
6. Selection of compatible donor:
   (*a*) By blood grouping alone.
   (*b*) By direct matching of donor and recipient alone.
   (*c*) Use of a preliminary blood grouping, followed by a direct matching.
7. (*a*) Are "universal donors" used? rarely? frequently?
   (*b*) Is any test done to exclude dangerous universal donors (persons having high-titered agglutinins in their serum)?
8. If figures are available, what is the incidence of post-transfusion chills?
9. Accidents following transfusions:
   Number.
   Nature and possible cause.
10. General remarks: for more detailed data or information on any of the above items or on features of the subject not indicated above; if necessary, attach another sheet.

From the Blood Transfusion Betterment Association of New York City.

SUMMARIZED RESULTS OF THE QUESTIONNAIRE

1. *Blood Group Classification*—The summary of the replies to the question on classification is given in table 1.

The results show that the Moss numberings are most widely used at the present time; the Jansky and the International classifications are employed with about equal frequency. However, when hospitals using more than one of the classifications are included (table 2), the International classification is employed in 23 per cent, while the corresponding value for the Jansky numberings is 16 per cent.

According to Kennedy's [1] report of 1929, the International classification was employed in 4.95 per cent of 525 hospitals; in a study of ninety-nine hospitals, Mason [2] in 1931 reported an incidence of 5 per cent. Our study shows an increase in the use of the International classification during the past eight years, but it is disappointing to record that the majority of the hospitals still employ a confusing arbitrary nomenclature,[3] in spite of the fact that in current scientific publications the International classification is used almost exclusively.

Obviously, any increase in the use of the O, A, B and AB terminology is a fortunate circumstance, since this classification, in contrast to the previous arbitrary numbers, is based on the universally accepted Landsteiner theory of two agglutinable substances, A and B, in the red cells. Thus, when one refers to the blood group of a universal donor as group O, it is made evident that the red cells are inagglutinable by virtue of their lacking in agglutinable substances, and it is

1. Kennedy, J. A.: Blood Group Classifications Used in Hospitals in the United States and Canada, J. A. M. A. **92**: 610 (Feb. 23) 1929.
2. Mason, J. M.: J. Med. **12**: 60 (April) 1931.
3. It may be noted that the International nomenclature was officially accepted by the National Research Council and the American Association of Immunologists in 1927 and by the League of Nations in 1928.

clear that persons with blood of groups A, B and AB have the corresponding agglutinable substances in their corpuscles.

It is hoped that the present defect in nomenclature will be corrected in the near future by (1) teaching of the International classification in the medical schools and (2) regulation of donor agencies by the various local boards of health in conjunction with the state

TABLE 1.—*Blood Group Classification*

	Number	Percentage
International	39	11.14
Jansky	44	12.57
Moss	203	58.00
International and Moss	33	9.43
International and Jansky	4	1.14
Jansky and Moss	4	1.14
International, Jansky and Moss	4	1.14
No answer	19	5.43
Total	350	99.99

TABLE 2.—*Classification Used Alone or in Combination*

	This Report		Kennedy's Report (1929)	
	Number	Percentage	Number	Percentage
International	80	22.86	26	4.95
Jansky	56	16.00	107	20.38
Moss	244	69.72	408	77.71

or county medical societies. The latter measure indirectly stimulates the use of the International classification, which is recorded in the donor's identification book along with the systems by numbers. These two factors serve to explain the greater use of the International classification in New York City hospitals (fifteen of thirty-seven hospitals). Unfortunately the hospitals associated with the majority of American medical schools do not as yet employ this classification. In one hospital affiliated with a Western medical school the International nomenclature is taught to the students but the Moss classification is employed in the hospital records.

2. *Number of Transfusions Performed in 1935 and 1936.*—Because of the difficulty of obtaining accurate hospital statistics, a detailed statement cannot be given. However, of 191 hospitals from which data were received, 77 per cent showed a decided increase in the number of transfusions in 1936 over the number in 1935. The remaining 23 per cent of the hospitals showed but a small decrease.

3. *Method of Transfusion.*—Of the 348 hospitals which replied to the question, 136 employ but one method, and 172 use two methods in varying degrees of frequency; in thirty-six hospitals three different procedures are available and in four hospitals each one of the four recognized methods is used.

The summary of the compiled data is given in tables 3 to 7 inclusive.

The citrate method is most popular in American hospitals for several reasons, but particularly because no special precautions are believed to be required.

Curiously enough four hospitals, three of them in Ohio and one in Tennessee, employ exclusively the procedure with paraffin-lined containers. These four hospitals have bed capacities of 142, 270, 210 and 246 and in 1936 performed sixty-two, 340, 152 and 213 transfusions. Aside from Ohio, the procedure still has a certain degree of popularity in Massachusetts, where the original method was described by Kimpton and Brown, and to a lesser extent in the Great Lakes region and also in California.

The Lindeman multiple syringe method is the choice of a number of hospitals in New York and New Jersey. This is not surprising in view of the past activity of Lindeman in popularizing his simple and efficient method in hospitals in and around New York. Analysis of the answers as to the use of some form of syringe-valve apparatus for direct transfusions revealed that at least twelve different instruments are employed in American hospitals. It is noteworthy that the simpler types are by far the most popular. A small number of hospitals reported using several varieties of instruments. It is not the purpose here to recommend any particular instrument; undoubtedly a number of effective instruments with manually operated valves are commercially available. However, it seems necessary to condemn any apparatus based on the principle of the automatic ball-in-valve, on the ground that the formation of small clots in the ball-in-valve may result in the injection of the recipient's blood into the donor. As previously pointed out by Hartman [4] with such instruments there is no guaranty of protection to the donor when patients with syphilis or any other infection of the blood stream are given transfusions.

It is significant that slightly less than half of all hospitals employ two transfusion methods. The most frequent combination, used in 136 of 350 hospitals, is the citrate method and one of the syringe-valve procedures. The ready availability of two methods apparently makes for a satisfactory and flexible arrangement, enabling the transfusionist to select a method which is considered to be more convenient or suitable in certain cases.

A small number of hospitals volunteered the information that the citrate method is employed in their pediatric service. For patients suffering from infec-

TABLE 3.—*Summary of Transfusion Methods*

Hospitals using one method	136
Hospitals using two methods	172
Hospitals using three methods	36
Hospitals using four methods	4
No answer	2
Total	350

TABLE 4.—*Hospitals Using One Method*

Modified blood (citrate)		98
Unmodified blood		38
Syringe-valve	17	
Lindeman (multiple syringe)	17	
Paraffin-lined containers	4	
Total		136

tions of the blood stream, the citrate method is used, apparently because it affords absolute protection to the donor. On the other hand, some of the advocates of the direct method believe that the advantages of the citrate method are more apparent than real and maintain that whole blood is preferable for patients with septicemia.

4. *Who Performs the Transfusions?*—Without going into detailed figures we may say that the questionnaires

4. Hartman, F. W.: Instruments for Blood Transfusion, J. A. M. A. **84**: 915 (March 21) 1925.

revealed that in the majority of the hospitals the transfusions are performed by the residents and interns under the supervision of either a resident or an attending physician.

In only a small number of hospitals is the transfusion placed in the hands of a team of a small number of experienced workers. This ideal method of handling transfusions is popular in the metropolitan area of New York. Of thirty-seven hospitals in New York City, twenty reported that a transfusion team is in charge.

TABLE 5.—*Hospitals Using Two Methods*

Citrate and syringe-valve	130
Citrate and Lindeman	21
Citrate and paraffin-lined containers	17
Syringe-valve and paraffin-lined containers	2
Syringe-valve and Lindeman	2
Total	172

TABLE 6.—*Hospitals Using Three Methods*

Citrate, syringe-valve and paraffin-lined containers	18
Citrate, syringe-valve and Lindeman	16
Citrate, Lindeman and paraffin-lined containers	2
Total	36

In more than one third of all hospitals the transfusions are not in the hands of any one department but can be done by any member of the attending staff. One obvious disadvantage of this open policy lies in the difficulty of supervision. One cannot expect expert performance from physicians who carry out transfusions only occasionally. In a good number of instances transfusions are performed by the ever changing house staff with no supervision whatever.

5. (*a*) *Donor Agencies.*—Of the 350 hospitals surveyed, 304 answered this question. Of these, 137 have their own list, recruited from their employees or from selected persons, fifty-three call donors from commercial agencies and sixty employ donors from their own list as well as from commercial agencies. Noncommercial donor agencies operated by the local board of health, the county medical society or both are located in but six large cities and two smaller ones. A small number of hospitals have at their disposal lists of volunteers, members of organizations such as the American Legion and the police and fire departments. The use of the radio for obtaining volunteers was mentioned in some instances.

(*b*) *Donors for Indigents.*—Of 318 hospitals which answered this question, 190 supply blood to indigent patients, for the most part at the expense of hospital, local or state funds.[5] No provision for supplying blood gratis to indigents is made in eighty-five hospitals, and forty-three other institutions offer this service only occasionally and when it is most urgently needed.

(*c*) *Cost of Blood per Hundred Cubic Centimeters.*—The 319 answers to this question show that in just about one half of the institutions the cost of blood is $5 per hundred cubic centimeters; in one third the cost is from $7 to $10. In a number of institutions the rate is somewhat higher for private patients.

5. In one of the state hospitals in the Middle West, between $25,000 and $30,000 is spent each year for this purpose. In this hospital (bed capacity, 954) about 1,000 transfusions were performed in 1936.

(*e*) *How Often Are Wassermann, Kahn or Kline Tests Repeated on Donors?*—Of the 350 hospitals circularized, 136 did not answer this question. However, in a number of these 136 a routine test for syphilis was performed immediately prior to the transfusion. Ninety hospitals reported that such tests are performed on their donors at intervals varying from one to three months. In 112 institutions these tests are done at intervals of six months or longer.

(*f*) *Is a Test for Syphilis Done Just Prior to Transfusion?*—The results in table 8 show that in 178 of the hospitals some form of test for syphilis is performed just prior to the transfusion. In the remaining 172 hospitals, either there is gross negligence or the factor of safety depends on the frequency of routine tests for syphilis carried out by the organization supplying the donors.

A correlated study of the frequency of routine tests for syphilis and of the test done just prior to transfusion reveals that 179 institutions attempt to protect their recipients from transfusion syphilis by the routine use of the pretransfusion test; of this group fifty-three hospitals are supplied with donors whose blood is examined at intervals of six months or less. In ninety-one hospitals the pretransfusion test is omitted and reliance is placed, so far as the serologic test for syphilis is concerned, on a routine test performed every six months or at shorter intervals.

There remains a group of seventy-one hospitals that are supplied by donor agencies where blood is tested but once, at varying intervals[6] or at intervals greater than six months, and these same hospitals fail to have any test for syphilis performed just prior to transfusion. In this group there is, therefore, a serious danger of the transmission of syphilis. (It is obvious that a careful physical examination of the donor is another necessary prerequisite. Unfortunately, this item was not included in the questionnaire.)

TABLE 7.—*Frequency of the Four Methods Used Alone or in Combination*

Citrate	306
Syringe-valve	189
Lindeman	62
Paraffin-lined containers	46

TABLE 8.—*Is a Test for Syphilis Done Just Prior to Transfusion?*

Test always done	178
Frequently or usually	36
Only on volunteer donors	26
Only on professional donors	5
Only on new professional donors	4
Test not done	83
No answer	18
Total	350

6. *Selection of Compatible Donor.*—The compiled data on this subject are recorded in table 9.

Undoubtedly the routine procedure of obtaining a compatible donor by a preliminary blood grouping, followed by a direct matching of the donor's cells and the recipient's serum, has been firmly established. This is evidenced by the fact that 310, or 89 per cent, of the 350 hospitals employ the two procedures in their proper sequence.

6. Replies to the questionnaire from this group include the answers "varies," "seldom," "occasionally" and "frequently."

Five hospitals report the use of a blood-grouping test alone.[7] While this may be a safe procedure in most cases if the grouping serums remain potent and sterile, most workers are agreed that direct matching is an additional necessary precaution which serves as a check on the blood-grouping tests. It is especially urgent in view of the fact that the Moss and Jansky classifications are so confusing. There is still another reason for routine matching; it is the only known method of detecting the presence in the recipient's serum of

Table 9.—*Selection of Compatible Donor*

Blood grouping alone	5
Direct matching alone	30
Both grouping and matching	310
No answer	5
Total	350

atypical agglutinins which may be active against the prospective donor's cells.

In thirty hospitals grouping of the patient's and the donor's blood is usually omitted and selection of the donor is made solely by the direct test, which determines that the donor's cells are not agglutinated by the recipient's serum. If the additional precaution (as a rule omitted) is taken to determine that the donor's serum does not clump the recipient's cells, the two bloods belong to the same group, but such tests do not identify the group. While such a procedure insures a selection of compatible donors, it is frequently laborious and time consuming. It should be pointed out that direct matching alone will fail to detect the incompatibility—which is not so very rare—due to weak agglutinins in the recipient's serum and weak agglutinogens in the donor's cells; for instance the incompatibility shown by a recipient of group O whose serum contains a weak anti-A and a donor of group A, subgroup A^2. The advantage of a preliminary grouping lies in the fact that with the use of potent grouping serums such incompatibility would be readily detected.

Consequently it seems essential to perform grouping tests with potent serums and, after selecting a donor of the same group as the recipient, to perform a direct matching of the latter's serum and the prospective donor's cells. The results of direct matching should confirm the compatibility. If the grouping is correct, any clumping in the direct matching will reveal atypical agglutinins in the patient's serum active on the donor's cells. In this event one must select another donor, whose cells are not sensitive to the action of the atypical agglutinin. (Many workers believe that it is not necessary to test for the absence of atypical agglutinins in the donor's serum which may be active against the recipient's cells.)

As already mentioned, when direct matching alone is employed, the groups of the persons involved remain unknown. Yet it is curious that twenty-six of the thirty hospitals depending on direct matching alone said in the questionnaire that they use one or another of the blood group classifications.

Of the thirty hospitals reporting the use of direct matching only, but three hospitals stated that they do the direct matching both ways; i. e., the more important test of the patient's serum and the donor's cells and also the test of the donor's serum and the patient's cells. It may be assumed that in the majority of the remaining twenty-seven hospitals only the more important cross test is performed. In these instances, the transfusionist does not know when or how often he is using universal donors.

It may be considered remarkable that from this series of thirty hospitals, two severe reactions were reported, details of which are not available. However, it is a well known fact that when incompatible blood containing weak agglutinogens is injected into a patient with weakly acting agglutinins the transfusion may be carried out apparently without untoward results, at least so far as immediate symptoms are concerned.[8]

7. *Universal Donors.*—A summary of the answers to questions dealing with the use of universal donors is given in table 10.

A consideration of table 10 shows that more than two thirds of the hospitals surveyed use universal donors "rarely" or not at all. Of seventy-nine (23 per cent) of the hospitals which reported the "frequent" or "moderate" use of such donors, only eight employ a test for the detection of the so-called dangerous universal donor. If one includes that larger group of institutions which use these donors "rarely" or "in emergency," only thirty-nine hospitals use any form of such a test.

In hospitals employing only the direct matching of the recipient's serum and the donor's cells, the transfusionist, as already pointed out, does not know when he is employing universal donors.

Universal donors are frequently used by one group of hospitals, and, in view of the rare application of the test to detect high-titered agglutinins, the dangerous donor must be used occasionally, and possibly with untoward results. In the section on post-transfusion reaction accidents to follow, three such reactions are

Table 10.—*Use of Universal Donors*

	No. of Hospitals
None used	108
Used rarely	146
Used moderately	10
Used frequently	69
No answer	17
Total	350

attributed to the dangerous universal donor. Obviously, when a professional donor is employed or when a choice of several volunteers is to be made, donors of the same group as the patient should be used. (However, in those exceptionally rare cases in which a transfusion is most urgently required, any one of a previously prepared list of group O donors with low-titered agglutinins may be used without any test.)

8. *Incidence of Post-Transfusion Chills.*—Obviously, in a survey of this character it is not possible to obtain sufficiently detailed data dealing with post-transfusion reactions and accidents. It may be stated also that the great majority of hospitals do not keep records of post-transfusion reactions in readily available form.

7. In two of these hospitals direct matching is apparently never done. (The number of transfusions performed in 1936 in these two hospitals is 331 and 340, respectively). Of the three remaining hospitals, one reported the use of direct matching in a few cases only, another that direct matching is done only on the physician's request and the third that the test is performed only when there is doubt as to the blood-grouping test. The number of transfusions performed in 1936 in the three hospitals is 120, 230 and thirty-seven, respectively. No accidents were reported by any of these five hospitals. However, another institution reported two severe hemolytic reactions due to mistakes in blood grouping. "These occurred before we began to do cross matching in addition to blood grouping. Donors were selected (at that time) by grouping only."

8. Grove, E. F., and Crum, M. J.: J. Lab. & Clin. Med. **16:** 259 (Dec.) 1930. Burnham, Lyman: Transfusion from a Group II (A) Donor to a Group III (B) Recipient without Fatal Result, Arch. Int. Med. **46:** 502 (Sept.) 1930.

However, from the material at hand, it is possible to state that of the 211 hospitals which responded to this question 135 (64 per cent) reported a low incidence of chills, i. e., 1 per cent or less; sixty-two (30 per cent) reported an incidence of from 1 to 10 per cent and fourteen (about 6 per cent) an incidence greater than 10 per cent.

A study of all hospitals using the citrate method exclusively indicates that these institutions reported either few or no reactions or else a relatively high incidence. This difference may perhaps be explained by the varying care taken in preparing the transfusion apparatus and the quality of the citrate solution employed. The meticulous care required for the successful use of the citrate method is described in detail in the paper of Lewisohn and Rosenthal.[9]

9. *Accidents Following Transfusions.*—Forty hospitals reported some form of accident that had followed transfusions; altogether there were sixty such accidents (sixteen deaths), which are summarized in table 11.

The largest group of accidents was attributable to the injection of incompatible blood. These thirty-six accidents, with six fatalities, were reported from twenty-five institutions. In cases in which the transfusion was completed, or comparatively large amounts of blood were administered, anuria or jaundice were reported; in the majority of the cases, symptoms developed shortly after the transfusion was started.

When one excludes three accidents due to the calling of the wrong donor or to the use of a random (nontested) donor, there remains a group of thirty-three accidents reported by twenty-two hospitals, resulting from the injection of incompatible blood. One hospital, which reported two accidents, selected donors on the basis of blood-grouping tests alone.[7] It is curious, indeed, that in the remaining twenty-one hospitals, which reported thirty-one accidents (with six fatalities), the incompatibility was not immediately detected although each of the twenty-one institutions reports the use of blood grouping followed by direct matching. Therefore one is led to believe that in the vast majority of instances the grouping serums employed are not potent and/or the persons performing the tests are not sufficiently trained.

In two cases mild hemolytic reactions occurred in repeated transfusions with the use of the same donor. In another case the recipient had an atypical agglutinin active against the donor's cells. A report of the latter case was recently published by Culbertson and Ratcliffe.[10]

In this connection attention is called to the two accidents that resulted from the calling of the wrong donor. Such accidents have occurred when several transfusions were scheduled to be done within a short period. It is difficult to understand how a donor can be used without the hospital's resorting to any compatibility test whatever.

Three accidents were attributed to the use of so-called dangerous universal donors; i. e., persons having high-titered agglutinins in their serum. One of these was well described in a case report published by DeGowin.[11] In two of the three cases the recipient had pronounced anemia; in the third case, in which the recipient was suffering from burns, there was probably concentration of the blood. In two of the hospitals involved, universal donors are used "rarely" and "frequently," respectively, but no test is performed to exclude dangerous universal donors. The third hospital reported the use of such a test only during the past year.

Four cases are reported of transmission of disease from donor to patient, three cases of syphilis, in each case from a relative, and one case of malaria.[12] In one case, syphilis was transmitted from father to son. In this hospital donors on its own list are tested for syphilis but once, and no test is made on any donor just prior to the transfusion. In another hospital that reported the transmission of syphilis the present policy is to test the donors on the hospital list every three months and to perform a test just prior to the transfusion on nonprofessional donors only. The third case of the transmission of syphilis was reported to have occurred twelve years ago; at present a pretransfusion test for syphilis is done on all prospective donors.

The case of malarial transmission was reported by one of the hospitals in the Middle West.

One fatal accident was attributed to allergy. In this instance "a child allergic to cow's milk" was given a transfusion of compatible blood from "a donor who had just previously ingested a large amount of cow's milk." No other details are available.

TABLE 11.—*Accidents Following Transfusion*

	No. of Cases	Fatal Cases
Incompatibility	36	6
Universal donor with high titered agglutinins	3	
Transmission of disease	5	
Allergic reaction	1	1
Poor transfusion technic	3	1
Death of donor	1	
Miscellaneous	11	8
Total	60	16

Under poor transfusion technic is listed one fatal case in which the transfusionist gave "too large an amount of blood for the size, weight and age of the child." In another case death was attributed to air embolism; the method employed was a "direct pump transfusion." In the third case a child was given a transfusion through the fontanel; apparently there may have been a subdural or epidural hematoma.

Under the heading miscellaneous are recorded four fatal cases of renal insufficiency in which there was no incompatibility. These were reported from the same hospital and were published by DeGowin.[13] In another case death resulted after injection of 150 cc. of compatible blood; the postmortem examination did not reveal the cause of death, which was recorded as "embolism or anaphylactoid." In one hospital two patients died with intense hyperpyrexia, the temperature being 112 and 115 F., ten and twelve hours, respectively, after the transfusion. Of the remaining four miscellaneous cases, one was fatal, death occurring after 50 cc. of blood was injected; at postmortem examination chronic glomerulonephritis and secondary anemia were observed.

Strangely enough, one hospital reported the death of a donor. To quote the report: "The donor refused to

9. Lewisohn, Richard, and Rosenthal, Nathan: Prevention of Chills Following Transfusion of Citrated Blood, J. A. M. A. **100:** 466 (Feb. 18) 1933.

10. Culbertson, C. G., and Ratcliffe, A. W.: Am. J. M. Sc. **192:** 471 (Oct.) 1936.

11. DeGowin, E. L.: Hemolytic Transfusion Reaction Produced by the Blood of a "Universal Donor," J. A. M. A. **108:** 296 (Jan. 23) 1937.

12. Another case of transfusion malaria, reported from a hospital in the metropolitan area of New York, has just come to our attention. The donor (father) gave a history of malaria forty years before, with no recurrences. Our attention was recently called to two cases in which blood from syphilitic (professional) donors was transfused.

13. DeGowin, E. L.; Osterhagen, H. F., and Andersch, Marie: Renal Insufficiency from Blood Transfusion, Arch. Int. Med. **59:** 432 (March) 1937.

rest in the hospital immediately after giving blood, did rather violent exercise soon after and died of acute dilatation of the heart." The autopsy report recorded "fatty degeneration" of the heart.

It may be mentioned once more that the present data cannot furnish an accurate index as to the frequency of transfusion accidents. Undoubtedly some accidents were overlooked or were not reported in the questionnaires.

COMMENT AND SUMMARY

This survey reveals some increase in the use of the International classification. This scientific and logical system will undoubtedly become still more popular when a greater number of medical schools teach it rather than the arbitrary, confusing and meaningless numberings. (A survey of medical schools with regard to this question is contemplated.)

The general adoption of statutes, similar to those of New York and Wisconsin, authorizing courts to accept the results of blood tests in paternity disputes,[14] will also stimulate the use of the International system, since it is difficult to discuss the genetics of the blood groups in terms of any other classification.

As already stated, the organization of suitably controlled donor agencies in New York City has been, at least in part, responsible for the frequent use of the International classification by New York City hospitals.

With regard to transfusion methods, it is noteworthy that about one half of the hospitals surveyed employ two methods, the citrate and one or another of the direct methods. Fortunately the great majority of transfusionists employing the direct method use either the multiple syringe procedure or one of the simpler forms of apparatus which are manually operated, and have avoided any apparatus in which the blood flow is regulated by a ball-in-valve mechanism.

In this country transfusions are for the most part performed, at least in ward cases, by members of the intern staff, under the sometimes inadequate supervision of a resident or member of the attending staff. Of course the ideal situation would appear to be that in which a transfusion team is employed in close association with the laboratory. However, with a rapidly changing house staff, such as is found in the great majority of hospitals, this apparently is believed to be possible only to a limited extent. Yet even under such conditions it is, in our opinion, feasible and practical that this work be done under the direct control of a small number of trained workers who instruct each new group of interns as they enter the hospital. Furthermore, the persons in charge might then form the liaison between the various hospitals, the local health department and medical societies to form a cooperative organization for the purpose of regulating professional donors and to serve as a center for the study of problems related to blood transfusion.

Some such cooperative action is required, since, as this survey reveals, many institutions lack adequate control of syphilis in both professional and volunteer donors. Until American hospitals have at their disposal donors from carefully regulated agencies, it seems essential for each hospital to perform a recognized test for syphilis immediately prior to the transfusion. This, however, does not in any way relieve the transfusionist from the responsibility of a careful physical examination of the donor.[15]

Although the routine practice of selecting a compatible donor by a blood-grouping test of the prospective donor's cells, followed by a direct matching of the donor's cells and the patient's serum, is well established, reference to the section on post-transfusion accidents, nevertheless, reveals that incompatibility of the bloods still accounts for numerous avoidable accidents. It is probable that mistakes in selecting donors are attributable to poor laboratory technic in general and, in particular, to the use of grouping serums that are not sufficiently potent. Unfortunately the source of the grouping serums was not investigated in this questionnaire; however, judging from our experience, it can be stated that in many institutions insufficient effort is taken to obtain potent serums.

Many unfortunate accidents might easily be avoided if a cooperative organization of hospital, medical society and local health authority, such as that suggested, would undertake to teach recognized laboratory procedures for compatibility tests. Such an organization might act as a local "registry" to which atypical blood could be sent for study and grouping and where transfusion accidents, so neglected at present, could be recorded and analyzed. Because of the widespread and increasing use of transfusions, these services, along with the control of the professional donor and measures to prevent transmission of disease by transfusion, are urgently necessary in the present American hospital program.

Beth Israel Hospital.

14. Levine, Philip: Wisconsin Law on Blood Tests, J. A. M. A. **105:** 1370 (Oct. 26) 1935.
15. Rein, C. R.; Wise, Fred, and Cukerbaum, A. R.: The Control and Prevention of Transfusion Syphilis, J. A. M. A. **110:** 13 (Jan. 1) 1938.

THE BLOOD TRANSFUSION BETTERMENT ASSOCIATION OF NEW YORK CITY

ORGANIZATION AND FUNCTIONING OF THE ASSOCIATION AND ITS BLOOD DONOR BUREAU

DE WITT STETTEN, M.D.
Chairman of the Board of Medical Control and Vice President of the Board of Trustees of the Association
NEW YORK

The Blood Transfusion Betterment Association of New York City, with its Blood Donor Bureau, was founded in 1929 under the auspices of the New York Academy of Medicine and with the aid of a small initial grant from Mr. John D. Rockefeller Jr. It is an expansion of the work of the Cooperative Blood Donors Bureau established at New York Hospital by Dr. Arthur F. Coca in response to a demand by hospitals and physicians for professional donors who have been reliably examined and thoroughly tested. Up to that time some individual hospitals and transfusionists had their own groups of donors, who were more or less carefully examined and tested, but most of the unsupervised and uncontrolled donors were supplied by commercial agencies, a large proportion of whose donors were frequently recruited from the less responsible elements of the community. Little consideration was shown for the welfare either of the donor or of the recipient. It became apparent that, in order to protect not only the patient from the receipt of incompatible or diseased blood but also the donor from ruthless exploitation and improper technical treatment, a more extensive community control was advisable. It was felt that, if a larger group of institutions and physicians were willing to cooperate in this matter by

Read in part at the second International Congress on Blood Transfusion, Paris, Sept. 29, 1937.

employing donors through one agency, much could be accomplished. A large list of donors, including those with the rarer types of blood, would always be available, and they would always be under proper control.

The association is incorporated as a non-profit making organization. Its services are available to all the hospitals and physicians of the city. A board of trustees of nine members, most of whom are physicians and hospital executives, is in control of the association. Professional supervision of the activities is vested in a board of medical control, thirteen physicians appointed annually by the board of trustees, to whom it is responsible. Five of the members represent, respectively, the New York Academy of Medicine, the New York Pathological Society, the department of health, the department of hospitals and the five county medical societies of greater New York. Most of the members of the board of medical control are experts either in hematology or in the practical aspects of transfusion or in both, and one of them is Dr. Karl Landsteiner of the Rockefeller Institute for Medical Research, the leading authority on blood grouping and the Nobel prize winner in medicine for 1930. His invaluable advice and assistance are always at the disposal of the association.

In 1930 the association cooperated with the committee on public health relations of the New York Academy of Medicine and the department of health in the formulation of sanitary code provisions for the control of professional blood donors.

HEALTH DEPARTMENT REGULATIONS

The sanitary code of the department of health of the city of New York defines the term "blood donor" as a person who offers his blood for transfusion purposes for a fee and lists the regulations by which he is controlled. A donor must be registered by the department of health. He must apply for registration on an official form supplied by the department, and at the time of application he must submit evidence that he has had a thorough physical examination by a duly licensed physician within the previous seven days. A prospective donor must be of normal weight, have normal blood pressure and show a negative reaction to the Wassermann test, given by the department of health. Certificates may not be issued to any person who has a history or symptoms of syphilis or malarial disease or who presents evidence of any disease of the heart, hyperthyroidism, asthma, status lymphaticus, tuberculosis, venereal disease or any other communicable disease or evidence of drug addiction.

At the time of certification, the donor is given an identification and personal record book, to which is affixed the seal of the health department and the date of registration. This personal record book contains a description of the donor and his blood classification, photograph and signature. In addition, there are entered in it the report on the Wassermann test of the blood made by the department of health at intervals of three months, the medical report on the physical examination and the donor's blood grouping. Subsequently there are entered the date of each transfusion, the amount of blood taken at each transfusion, the name of the physician administering the transfusion and the place where it was performed.

Hospitals and physicians not subject to hospital regulations must keep records of all the data pertaining to transfusions, and these records must be open to inspection by the health department.

Not only must the tests for syphilis be repeated every three months, but within the three weeks previous to each transfusion the donor must undergo a medical examination to check his physical condition and the hemoglobin content of his blood, which must be at least 85 per cent. Furthermore, immediately prior to the transfusion, the physician making the transfusion must reexamine the prospective donor. If at any time the donor should be found lacking in the qualifications for which he is examined, his license may be revoked.

Except in emergencies only registered blood donors may be used.

In addition to these provisions, the sanitary code contains regulations relative to the control of blood donor agencies. These regulations require the licensing by the department of health of all such agencies, define the term "blood donor agency," and cover all the questions that are pertinent to their control. Agencies must keep records of all donors and the services which they perform. They may employ only donors certified by the health department, and care must be taken that a donor is not used too frequently. Licenses of agencies may be revoked for any violation of the sanitary code regulations.

ORGANIZATION OF THE WORK OF THE BLOOD TRANSFUSION BETTERMENT ASSOCIATION

The Blood Transfusion Betterment Association maintains a blood donor bureau, with offices, clinic rooms and laboratories, in a first floor apartment at 39 East Seventy-Eighth Street, New York. The professional management of the bureau is under the supervision of a salaried medical director, at present Dr. Arthur F. Coca, who was responsible for the formation of the association and who now supervises its technical and scientific activities. Dr. Coca is not a full time director but is assisted by a codirector, Dr. Eugene M. Katzin. It is planned in the near future to install in the bureau a full time resident medical director who will have complete supervision over the laboratory technicians. The business management of the bureau is directed by Dr. E. H. L. Corwin, secretary-treasurer of the association and executive secretary of the committee on public health relations of the New York Academy of Medicine.

Clinics for the examination of donors, conducted by thoroughly trained young physicians, generally recruited from the intern staff of one of the larger hospitals and under the supervision of a member of the board of medical control, are held five times a week. Extreme care is used in the examination of donors, and a high standard of physical requirement is maintained. Hitherto only men have been used, but it is planned to establish in the near future a small list of women donors for special needs, such as transfusions to be given to children and to women in religious institutions. The men have been recruited from among students, professional men and workers of all kinds, and they are in a position to answer a call and offer their services at any time of the day or night. Only those who have a telephone are accepted. Once accepted for registration with the bureau, they are kept under strict supervision, and arrangements for their services as donors are made only through the office of the bureau.

The prospective donor receives a preliminary examination for general appearance and suitability of veins, followed by a complete physical examination. The minimum weight acceptable is 150 pounds (68 Kg.). The blood is then taken to determine the blood group, the Wassermann reaction and the percentage of

hemoglobin. For blood grouping the bureau uses the International, or the O, A, B and AB, designation established by Dr. Landsteiner, because it is generally considered the most practical and the safest. "Universal," or O, donors are separately classified into two groups, "safe" and "dangerous."

Until recently the Wassermann test, according to the statute, was regularly repeated by the department of health every six months, and the bureau further controlled the donor by a Kahn test taken every alternate six months, so that the donor received a serum test for syphilitic infection every three months. Now that the regulation in the sanitary code has been amended by the department of health to the effect that the department must perform a test for syphilis every three months, the Blood Donor Bureau will control the initial Wassermann test of the department of health by a Kahn test and repeat the Kahn test when the donor returns to the bureau for reexamination after he has been used and before he is sent out for another transfusion. It is felt that this method, coupled with a careful physical examination of the donor for evidences of active syphilis by the doctor performing the transfusion, and a rapid Kline test by the hospital laboratory just before the transfusion, is amply sufficient to safeguard against the transmission of syphilis. More frequent compulsory tests would be a burden on the donor and might discourage their remaining on the lists.

For the hemoglobin determination the Dare hemoglobinometer is used, and no donor is utilized whose hemoglobin falls below the required minimum of 88 per cent. If acceptable, the candidate is photographed and application is made for registration at the department of health on a special form issued by the department. When the passbook is received from the department the donor is ready to answer calls. All donors must carry their passbook when responding to calls. The passbook of donors from the bureau is specially stamped with the name and address of the association. If for any reason the applicant is rejected by the department of health, he is not accepted for registration by the bureau.

Donors are supplied with a pamphlet of instructions to insure cooperation on their part in the mechanics of the service and to give them information as to their conduct, habits and general health. They must notify the bureau if they leave their telephones while on call, and a penalty of three months' suspension is imposed for tardy arrival at a hospital. Every effort is made to safeguard the donor, as well as the patient, particularly against too frequent donation of blood, infection or the unnecesssary cutting down on veins. Each donor remains off the active list one week for every hundred cubic centimeters of blood given. A notice is pasted in the passbook under the authority of the association, as follows:

> The "cutting down" on veins of donors supplied by the Donor Bureau of the Blood Transfusion Betterment Association is specifically *prohibited* by the rules of the Association as it is unnecessarily disabling, exposes the donor to the danger of infection, and tends to destroy his veins and render him unfit for further service. Doctors using our donors will please observe this rule.

Aside from a few trivial local infections of donors and an occasional complaint from a donor that there has been either unskilful puncturing of the vein or cutting down on the vein, there have been no real mishaps or accidents to donors in the seven years that the bureau has functioned, and in the past two years there have been no infections or accidents whatever.

As of Jan. 1, 1938, the bureau has an active list of 1,994 donors. They are divided as follows: group O, 946, or 47 per cent; group A, 732, or 37 per cent; group B, 232, or 12 per cent, and group AB, 84, or 4 per cent.

The bureau functions in the following manner: A record of each donor, with the results of his examination and blood typing, is kept in a card file for ready reference. A second card index of the donors available and active, listed on different colored cards according to groups, is kept within easy reach of the attendant on duty. The service is on a twenty-four hour basis, 365 days of the year. Numerous emergency calls are received at the office nightly. When a request for a donor is received, entries are made of the name of the patient, the name of the hospital and of the doctor performing the transfusion, or of the private physician, as the case may be, the type of donor needed and the urgency of the call. If it should be requested and a specimen of the patient's blood is furnished, the donor's blood is crossmatched with it by means of the Landsteiner technic. On receipt of a call the office attendant consults the card index and gets in touch by telephone with a donor who meets the requirements as to type of blood and any other necessary qualifications. Subsequently the hospital is given the name of the assigned donor and the approximate time of his arrival. Donors are sent by taxicab whenever the time element is especially important, and in all instances an effort is made to avoid unnecessary delay in transit by assigning a suitable donor from as near the hospital as possible.

On receiving the telephone message the donor proceeds at once to the hospital, where he reports to the proper office and where his credentials are examined and his type is checked to make certain that he meets the requirements. He is then examined, generally by the physician who is to give the transfusion, for evidences of any acute illness, particularly active syphilis. If he passes he is usually required to sign a release absolving the hospital from any liability as a result of the donation of blood. The following form, from Lenox Hill Hospital in New York City, is the type commonly used:

> To Whom it May Concern:
>
> Having been requested by the relatives and friends of..... to furnish blood for transfusion in her/his case, I hereby declare to do so voluntarily. The Lenox Hill Hospital is in no way responsible for any consequences which may arise from the operation connected with the treatment, nor is the Lenox Hill Hospital responsible for any compensation whatsoever in the matter.
>
> Name.....
>
> Witness.....

The donor's blood is crossmatched with that of the patient before the transfusion is given. After the transfusion the donor is expected to rest for an hour. He then proceeds to the cashier's office of the hospital, where he is paid for his services at the rate of $7 per hundred cubic centimeters of blood, with a minimum charge of $14, even for any quantity under 200 cc. This rate has been fixed by the association as a fair compensation. The record in the passbook of the amount of blood withdrawn constitutes a voucher to

the cashier as well as a guide to the bureau as to the availability of the donor. For its services in supplying a donor, the association charges a flat fee of $6 irrespective of the amount of blood used, which is billed to and paid by the hospital or private physician using the donor. After a donor has submitted to a transfusion he must remain off the active list for one week for every hundred cubic centimeters of blood given. Before he is used again, or if a three weeks period in which he has not been used has elapsed, he is given a complete reexamination at a bureau clinic, a fresh hemoglobin reading is made and the Kahn test is repeated.

GROWTH OF THE SERVICE

To give an idea of the response of the community to the Blood Transfusion Betterment Association, it is only necessary to cite the extraordinary strides made by the association in supplying donors, even through the severe economic depression. Donors have been supplied by the bureau and actually used, annually from 1930 through 1937, as follows: 1930, 3,125; 1931, 4,020; 1932, 4,852; 1933, 4,999; 1934, 5,216; 1935, 5,830; 1936, 6,686, and 1937, 9,280.

As will be seen from these figures, the work of the association has tripled since its formation seven years ago, and it still seems to be growing. All the municipal and most of the voluntary hospitals and numerous individual physicians in greater New York and some in the suburbs and neighboring towns have become its patrons. Private lists of donors kept by hospitals and doctors are gradually being abandoned in its favor. So great has been its growth that it became necessary last fall for the bureau to enlarge its quarters and to rent an additional apartment in the same building for more offices, clinic rooms and laboratory space.

The bureau has been making its own testing serums from high-titered bloods of selected A and B donors. To avoid errors the group A serum is colored red with eosin, and the group B serum is colored with methylene blue.

RESEARCH ACTIVITIES

As stated in the articles of incorporation of the association, its aims and purposes are:

> The advancement of the science of blood transfusion; the furnishing of voluntary aid, exclusive of medical or surgical advice, to persons in need of blood transfusion; the classification of prospective blood donors and collecting information in regard to the same; the studying of the practice of the transfusion of blood in general; the conducting of investigations, experiments and researches generally to improve blood transfusion; all of the purposes being for the conservation of the public health insofar as it is related to the use of blood transfusion as a therapeutic measure; and the maintaining of a general organization to carry out the above purposes without pecuniary profit.

With these aims in view, in addition to developing a most effective blood donor service and preparing high-titered blood-grouping serums, the association has carried on, with its accumulated surplus funds, numerous other important activities. These have consisted of giving postgraduate training in both the technic of blood transfusion and the laboratory work of blood grouping and blood matching, of sponsoring and financially aiding important research in various aspects of transfusion, and of educating the public generally on the subject of transfusion.

In 1933 a committee on instruction of the board of medical control arranged for a series of lectures to physicians and laboratory workers by experts on the "Technic of Blood Transfusion" and a second series on "Blood Grouping and Matching" and "Medicolegal Applications of Blood Groups." In addition, the medical director gave seven laboratory demonstrations at the bureau to small groups of physicians and laboratory technicians on "Methods of Blood Grouping and Blood Matching." These demonstrations were repeated recently.

Dr. Arthur F. Coca, the medical director, has made a study of the use of naturally immune and artifically immunized donors in the treatment of certain types of pneumonia. His theory was put to a test at the Harlem Hospital in New York City by Drs. Jesse G. M. Bullowa and William H. Park, under the auspices and with the financial aid of the association, but, unfortunately, did not yield any practical results, and for the time being the study has been abandoned.

Research in regard to the immunization of donors to staphylococcus and hemolytic streptococcus infections is being continued.

Dr. Coca has also made an exhaustive study of the problem of "universal" donors and has developed some new and safer serum tests, on which he reported at the second International Congress on Blood Transfusion in Paris last September.

The bureau is engaged in an extensive statistical study of (1) the indications for transfusion and (2) the causes of unusual post-transfusion reactions.

Under the direction of Dr. Philip Levine of the board of medical control and Dr. Eugene M. Katzin, a survey of the entire transfusion situation in the United States has been made by questionnaire, particularly to find out which method of transfusion is the most popular.

During the past year the association has rendered financial aid to Dr. Joseph Felsen of the Bronx Hospital, New York, in his studies on the use of immunized donors in the treatment of bacillary dysentery, to Dr. Fritz Schiff of the Beth Israel Hospital, New York, in his work on the duration of life of transfused blood in respect to "secretors" and "nonsecretors," to Dr. Thomas Hale Ham of the Thorndike Memorial Laboratory of the Boston City Hospital, Boston, for his research on blood transfusion and its effect on hemolytic processes, and to Dr. Philip Levine of the Newark Beth Israel Hospital, Newark, for his investigation of atypical agglutinins and their bearing on unusual reactions after blood transfusions.

This year a series of short pamphlets, written by members of the board of medical control, will be distributed to members of the medical profession of the city of New York by the department of health with its quarterly bulletin. The titles and authors of these pamphlets are as follows:

"The Indications for Transfusion," by Dr. Reuben Ottenberg.

"Blood Grouping and Blood Matching Technic," by Dr. Philip Levine.

"The Blood Donor Bureau and the Examination of Donors," by Dr. David C. Bull.

"The Accepted Methods of Blood Transfusion," by Dr. Lester J. Unger.

"The Use of Universal Group Donors," by Dr. Arthur F. Coca.

The association has just completed an autochrome moving picture on the working of the Blood Donor Bureau, the technic of blood grouping and matching, and the three accepted methods of blood transfusion, the citrate method, the multiple syringe or Lindeman

method, and the syringe-valve or Unger method. This film was prepared at the suggestion of the Maternal and Child Health Division of the United States Department of Labor and is to be used chiefly to educate general practitioners in the various phases of transfusion. The film was shown at the Paris congress by Dr. Lester J. Unger.

CONCLUSION

It is safe to say that the work that has been done by the Blood Transfusion Betterment Association and the recognition which it has received in the city of New York will stimulate the organization of services along the same lines elsewhere. Any city of considerable size with its suburbs or satellite towns can establish a similar organization without great difficulty and with the promise that it will function as usefully as the Blood Transfusion Betterment Association of New York City.

850 Park Avenue.

KIRSCHNER TRACTION IN THE TREATMENT OF MAXILLARY FRACTURES

GLENN MAJOR, D.D.S., M.D., PH.D. IN SURG.
PITTSBURGH

Numerous methods and mechanical devices have been perfected for the treatment of fractures of the superior maxilla. This fact implies that each appliance does not readily adapt itself to the treatment of all types of maxillary fracture. As in the case of fractures elsewhere, the position of the fragments must be considered before a satisfactory method of reduction can be selected. Furthermore, under certain conditions perfect apposition of the fragments is demanded.

It is a noteworthy fact that a high percentage of fractures of the upper jaw are complicated by fracture of the skull through the anterior cranial fossa. Most of these fractures are compound, projecting through the nose, and nasal drainage of cerebrospinal fluid is usually present. Obviously, the first consideration is the possibility of injury to the brain, due either to laceration or to hemorrhage, and the second consideration is the potentiality of intracranial infection in the nature of meningitis, sinus thrombosis or abscess of the brain. The patient should be treated conservatively for at least one week, the treatment being that ordinarily employed for fracture of the skull. In addition the maxilla should be immobilized as completely as is possible with a head-chin bandage, a procedure which is grossly inadequate at best. The nose should be sprayed at frequent intervals with an antiseptic solution, the nature of the solution depending on the preference of the surgeon. At the Western Pennsylvania Hospital, tincture of merthiolate is employed. The primary principle in the early treatment of fractures of this type is conservatism, with absolutely no manipulation of the fragments. It seems probable that the area surrounding the fracture of the skull is soon walled off by a blood clot, and to manipulate the maxillary fragments in this stage is to reopen the area and thus increase the possibility of intracranial infection.

Another feature demanding attention in the treatment of fractures of the upper jaw is the question of diplopia. It is amazing the amount of comminution that may occur in the region of the floor of the orbit with no disturbance in normal binocular single vision. This is probably explainable on the basis of an intact suspensory ligament, which may maintain the eye in its normal position despite marked destruction of the bony floor of the orbit. However, if the fracture is accompanied by injury to the facial attachments of the ligament or by laceration of the ligament itself, diplopia often results. It is then imperative that the fragments be reduced accurately, so that the two eyeballs are brought to the same normal horizontal level. Such a fracture is illustrated in figure 1.

A feature of fracture of the maxilla which is peculiar to this injury is the question of involvement of the maxillary frontal or ethmoid sinuses. Rarely does a fracture of the maxilla occur in which the fracture line does not involve one of these sinuses. Fortunately, however, marked sinus infection after such an injury is the exception rather than the rule. It is true that the sinuses transilluminate poorly at first, the cloudiness being due to the extravasation of blood into the cavity in question. Only occasionally does the sinus become clinically infected. This complication, when it occurs, is treated as acute sinusitis without fracture.

One other feature of the maxilla which is worthy of note is the tardiness of union of the bone. Usually at the end of from three to five weeks all splints may be removed, but as a general rule several more weeks, or sometimes months, must elapse before complete firm union has resulted. In this regard, fractures of the maxilla differ radically from those of the mandible, in which union is usually prompt.

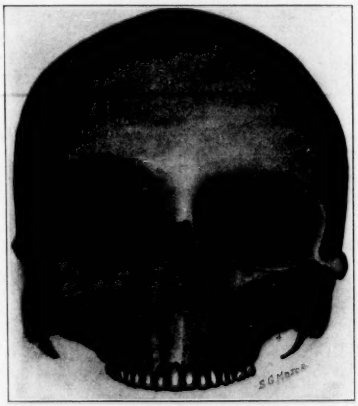

Fig. 1.—Comminuted fracture passing through the floor of the orbits.

Another difference between fractures of the maxilla and those of the mandible is the frequency of osteomyelitis at the line of fracture. This complication in the upper jaw is rather uncommon, while in the mandible it occurs in from 5 to 10 per cent of the cases. The explanation of this discrepancy depends on the better blood supply of the maxilla and the fact that when compound fractures of the mandible project into the mouth drainage is inadequate along the fracture line.

From the Department of Maxillo-Facial Surgery, Western Pennsylvania Hospital.

In treating fractures of the jaws the occasional surgeon in this field often forgets one obvious fact. The teeth must be brought into occlusion, and the cusps of the teeth should interdigitate in their normal relations. Otherwise the functional result will be poor. When the maxilla or the mandible is fractured, a perfect

Fig. 2.—Rubber band traction for the reduction of fractures of the maxilla.

functional result usually implies a perfect anatomic result. Exceptions occur when the mandibular rami or the neck of the condyle is fractured.

In general, three methods are used at present in the treatment of fractures of the maxilla. First, traction is exerted by rubber bands between a head cast or head cap and lugs brought out at each angle of the mouth, the lugs being soldered to a splint which is wired to the upper teeth. In some cases this method is adequate. However, in such cases there is a marked tendency to depression of the posterior aspect of the maxilla. When this method is used in our clinic my associates and I advocate, in addition to the splint, rubber band traction or wiring between the maxillary and the mandibular teeth, to preserve the interdigitating relation between the two sets.

A second method is simply to use rubber band traction between a head cast or head cap and mole skin applied to the skin or a molded, well padded plaster chin piece. In my hands this procedure has been inadequate, as well as uncomfortable to the patient. If it is used, interdental wiring or interdental rubber band traction is again recommended, to preserve the finer relations between the teeth.

A third method is simple interdental wiring or interdental rubber band traction. In case of an incomplete horizontal fracture of the maxilla this is an adequate procedure. It is particularly well adapted to the treatment of unilateral fractures of the alveolus or vertical fractures.

In our clinic we have occasional cases of fracture of the maxilla in which we experience considerable difficulty in restoring the lower fragment to its original position. Because of the delay of a week or ten days before reduction is attempted, we feel that there is considerable organization of the hemorrhage between the fragments, which renders complete reduction difficult. The patients often complain bitterly of pain with skin traction and the other methods discussed. As a solution to this problem, it occurred to us that skeletal traction would be valuable. At the present time we are treating these more difficult fractures as follows:

One week after the cerebrospinal rhinorrhea has ceased, in the absence of symptoms suggestive of intracranial infection or increased intracranial pressure, a head cast is applied. The method of application is important and is described fully by Ivy and Curtis.[1] A heavy iron wire is incorporated in the cast, conforming to the contour of the head, with a lug emerging from the cast above and anterior to the tragus of each ear. Another smaller wire emerges from the cast in the frontal area. The former wire is used for traction, as discussed later, and the latter is used to attach the spreader to the head cast, as described hereafter.

The mandibular nerve is injected on each side with procaine hydrochloride. After topical anesthesia of the mucous membranes of the upper jaw is secured and this deep nerve of the lower jaw is injected, splints are applied to the labial and the buccal aspects of both the upper and the lower teeth. The splints are wired to three or four teeth on each side above and below with double 26 gage stainless steel wire. Any one of several splints may be used for this purpose, but in our clinic we have used the splint made by the Jelenko Company. This splint is provided with lugs at intervals of about 1 cm., the lugs on the upper splint being directed upward and those on the lower splint being directed downward. The splints are applied at this time so that, after the fracture has been gradually reduced by skeletal traction,

Fig. 3.—Apparatus for the reduction of fracture of the maxilla by skeletal traction.

rubber bands may be applied between the upper and the lower splint and the finer adjustments made to bring the teeth into their original relations.

Under sterile conditions a Kirschner wire is now inserted into the symphysis of the mandible. No additional anesthesia is required, since the mental nerve has been anesthetized. A small nick is made in the skin and

1. Ivy, R. H., and Curtis, Lawrence: Fractures of the Jaw, Philadelphia, Lea & Febiger, 1931.

extended down to the outer aspect of the mandible. With a bone drill a hole is started in the mandible at a point one-eighth inch above its inferior border and one-half inch posterior to the symphysis, so that injury of the mental nerve is avoided as well as injury of the apexes of the teeth. After the hole has been started, the Kirschner wire is introduced and is brought out on the opposite side of the mandible at a point corresponding to the point of entrance. This wire lies entirely within the mandible and does not pass through the floor of the mouth, being entirely extra-oral. As the wire emerges a small nick is made in the skin. A spreader is attached and dressings applied to the points of entrance and exit of the wire. The spreader is brought up to the frontal area and attached to the cast wire in that position. Traction is not applied to the spreader itself. S-shaped hooks are applied to the Kirschner wire on each side, and similar hooks are placed on the iron wire incorporated in the head cast in the preauricular areas. A turnbuckle (32 threads to an inch) is inserted between the two S-hooks on each side, and the slack is taken up by turning the turnbuckle. Originally we employed rubber band traction, as shown in figure 2, but we find that more gradual traction can be exerted by the turnbuckles. The patient is then returned to his room. The apparatus is shown in figure 3.

Several days should be consumed in effecting the reduction. The nurse is instructed to turn each turnbuckle one eighth of a revolution every three hours. If the patient complaints of pain in the region of the fracture the turning is done more slowly. The desirability of this method lies in the fact that reduction can be accomplished gradually, thereby lessening the chance of further injury to the contents of the anterior cranial fossa and minimizing the tendency to reopen sealed off defects in the anterior fossa. Another prominent feature is the almost complete absence of discomfort. It will be evident that the reduction is effected by force transmitted through the mandibular to the maxillary teeth.

After the reduction has been completed, the wire and the spreader are left in place for three or four days, after which the wire, head cast and spreader are removed and rubber bands are applied between the previously placed upper and lower intra-oral splints. The splints are worn for an additional period of from three to five weeks, depending on conditions, after which they are removed.

In this manner the more difficult fractures can be reduced and excellent anatomic and functional results obtained with a minimum of discomfort. A concomitant fracture of the mandible may occasionally be a contraindication to this method. Ordinarily the method is not applicable in the treatment of edentulous persons. We have not used it in treating such persons with the dentures in place.

SUMMARY

The method described for the gradual reduction of horizontal fractures of the maxilla, based on the principles of skeletal traction and involving a Kirschner wire, is considered valuable for three reasons: It effects gradual and complete reduction of these fractures, and tremendous force may be exerted, if desired, with practically no discomfort to the patient; the apparatus can easily be applied with the patient under local anesthesia, and there is little possibility of additional intracranial injury or infection, because of the gradual reduction.

7125 Jenkins Arcade Building.

CHEMOPROPHYLAXIS IN POLIOMYELITIS

THE TECHNIC OF APPLYING CHEMICAL AGENTS TO THE OLFACTORY MUCOSA

LEE SHAHINIAN, M.D.
J. A. BACHER, M.D.
R. C. McNAUGHT, M.D.
AND
R. R. NEWELL, M.D.
SAN FRANCISCO

The observations of Armstrong and Harrison,[1] those of Sabin, Olitsky and Cox[2] and, especially, those of Schultz and Gebhardt[3] seem to show conclusively that certain chemical agents carefully applied to the olfactory mucosa of monkeys afford considerable protection against infection by subsequent intranasal instillation of poliomyelitis virus. The essential observations which have been made up to the present were summarized in a recent article by Schultz and Gebhardt[4] and therefore do not need to be repeated here.

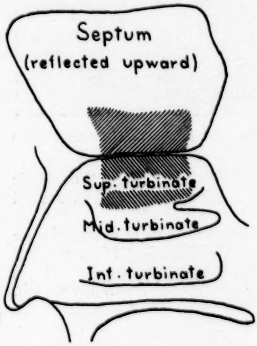

Fig. 1.—The shaded areas show the location and the extent of the olfactory membrane (after Effie Read).

This evidence, that a chemical agent such as 1 per cent zinc sulfate confers on monkeys a high degree of resistance against poliomyelitis virus for at least one month after treatment, suggests that such a prophylactic measure may deserve a trial in human beings during periods when poliomyelitis is prevalent. We have concerned ourselves primarily with devising a method of applying the prophylactic treatments that can be easily and accurately used by the physician with a minimum of discomfort and risk of injury to the patient.

PREVIOUS PROCEDURES

1. *Atomizer Methods.*—Peet, Echols and Richter[5] have made adequate studies of these methods. They determined that the plain atomizer is inefficacious and described the use of a special atomizer tip, which is introduced between the middle turbinate and the sep-

From the Departments of Otorhinolaryngology and Radiology, Stanford University School of Medicine.

Prof. E. W. Schultz cooperated in this work and shared with us his allotment of the Jeremiah Milbank Fund for Infantile Paralysis Research.

1. Armstrong, Charles, and Harrison, W. T.: Prevention of Experimental Intranasal Infection with Certain Neurotropic Viruses by Means of Chemicals Instilled into the Nostrils, Pub. Health Rep. **51**: 203 (Feb. 28) 1936.

2. Sabin, A. B.; Olitsky, P. K., and Cox, H. R.: Protective Action of Certain Chemicals Against Infection of Monkeys with Nasally Instilled Poliomyelitis Virus, J. Exper. Med. **63**: 877 (June) 1936.

3. Schultz, E. W., and Gebhardt, L. P.: Prevention of Intranasally Inoculated Poliomyelitis in Monkeys by Previous Intranasal Irrigation with Chemical Agents, Proc. Soc. Exper. Biol. & Med. **34**: 133 (March) 1936.

4. Schultz, E. W., and Gebhardt, L. P.: Zinc Sulfate Prophylaxis in Poliomyelitis, J. A. M. A. **108**: 2182 (June 26) 1937.

5. Peet, M. M.; Echols, D. H., and Richter, H. J.: Chemical Prophylaxis for Poliomyelitis: Technic of Applying Zinc Sulfate Intranasally, J. A. M. A. **108**: 2184 (June 26) 1937.

tum to insure accurate placement of the solution to the olfactory area. This procedure is difficult and admittedly not free from danger.

2. Postural Methods.—These methods depend on the localization of the prophylactic fluid in the nasal vault by gravity. Peet and his associates [5] dismissed the routine instillation of the fluid into the nose by dropper as unsatisfactory. They quoted no experimental evidence against this practice except to state that radiopaque material did not regularly reach the olfactory area when sprayed into the nose with an ordinary atomizer, the patient being held in the Proetz inverted position.

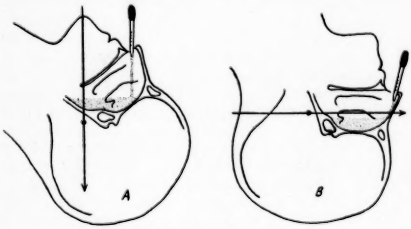

Fig. 2.—*A*, head inverted so that the chin and the auditory meatus are in the same vertical plane (Proetz position). Fluid dropped into the nose primarily seeks the pocket formed by the cribriform plate and the face of the sphenoid bone. The cribriform plate is approximately 40 degrees from horizontal. *B*, head completely inverted, so that a line between the infra-orbital ridge and the external auditory meatus is horizontal. The cribriform plate is approximately horizontal. Fluid placed in the olfactory groove at the limen nasi accurately reaches and fills the inverted common nasal meatus.

A recent paper by Pentecost [6] advised the direct placement of the prophylactic fluid in the olfactory area with an olive tip ureteral catheter inserted between the middle turbinate and the septum, with the patient's head in the Proetz position ("head is inverted so that the chin and external auditory meatuses are in the same vertical plane"). His experiments on human volunteers consisted of thus placing a solution of local anesthetic and then testing for loss of sensation in the olfactory area. We used a variation of this method in our basic studies but believe the position to be incorrect and the procedure more difficult than necessary.

ANATOMIC CONSIDERATIONS

The olfactory area covers nearly the whole of the superior turbinate, a small contiguous portion of the middle turbinate and the area of the septum directly opposite these surfaces [7] (fig. 1). The olfactory surfaces enclose approximately the upper third of the common nasal meatus. Hence, if this fissure-like space is filled to sufficient height with a lake of fluid, the olfactory membrane will be completely immersed.

The base line of the skull (Reid's base line) extends from the infra-orbital ridge through the external auditory meatus. It is approximately parallel to the cribriform plate, which forms the bony roof of the nose. When the head is completely inverted, with the base line horizontal (figs. 2 *B* and 3), the cribriform plate becomes the horizontal floor of a narrow trough, the inverted common nasal meatus.

When the chin and ear line is vertical, the cribriform plate is tipped at an angle of 40 degrees from horizontal. Proetz [8] originally described this position for use in the displacement method of filling the accessory nasal sinuses, for which purpose it is excellent. It is unsuited, however, for use in applying solutions accurately to the olfactory area. When the head is in this position, the pocket formed by the cribriform plate of the ethmoid process and the face of the sphenoid bone constitutes the angular floor of the nasal chamber (figure 2 *A*). Hence, limited quantities of fluid dropped into the nose will primarily seek this lowest level and, secondarily, reach the level of the olfactory area only if more fluid is added. This additional fluid may be insufficient to cover the olfactory area if the normal sinus ostia are sufficiently patent, as they frequently are, to allow the fluid to escape into the sphenoid and posterior ethmoid sinuses.

The olfactory sulcus is a narrow cleftlike space on the inner surface of the dorsum of the nose, formed by the arched confluence of the septum and the lateral nasal wall. It leads from the nasal vestibule to the roof of the common nasal meatus. Common aberrations in nasal structure do not seem to destroy the integrity of this groove along the vault of the nose, since it is above the attachment of the middle turbinate to the lateral nasal wall and is therefore relatively unaffected by abnormalities of turbinate and septum.

PROCEDURE ADVISED

We have roentgen and clinical evidence to show that when the head is completely inverted, with the base line horizontal (figs. 2 *B* and 3), limited quantities of fluid introduced slowly into the olfactory sulcus at the limen nasi will flow along the groove and accurately fill the inverted common nasal meatus, in a selective manner, to a height usually sufficient to immerse most of the estimated olfactory area. This method was found to be as efficient as the more difficult procedure of direct placement of fluid to the olfactory area with a delicate ureteral catheter placed between the middle turbinate and the septum.

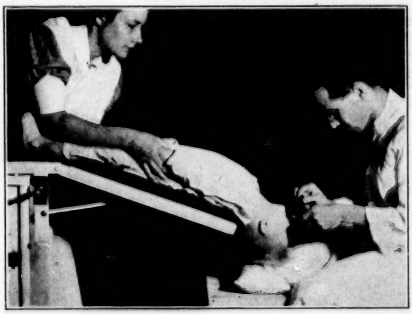

Fig. 3.—Proper position and technic for applying prophylactic solution to the olfactory area. The base line of the skull is horizontal.

Previous shrinkage of the nose was found unnecessary. All solutions placed in the nose were found to be better tolerated when previously warmed to body temperature in a water bath. Ordinary medicine droppers, previously calibrated for volume, are used. With a speculum spreading the anterior naris, the tip

6. Pentecost, R. S.: Zinc Sulfate as a Chemoprophylactic Agent in Epidemic Poliomyelitis, Canad. Pub. Health J. **28**: 493 (Oct.) 1937.

7. Read, Effie A.: A Contribution to the Knowledge of the Olfactory Apparatus in Dog, Cat and Man, Am. J. Anat. **8**: 17 (Feb.) 1908.

8. Proetz, A. A.: The Displacement Method of Sinus Diagnosis and Treatment, St. Louis, Annals Publishing Company, 1931, chap. 5.

of the dropper is inserted approximately 0.5 cm. into the naris, at the anterior angle of the nose, without touching the sensitive mucous membrane walls. The fluid is introduced slowly and steadily, drop by drop. The patient is kept in the inverted position one minute after the last drop has entered.

At the end of treatment, the solution may be emptied by the route of entry by having the patient turn over into the prone position, lift his head and sniff outward. This procedure prevents unpleasant effects on the throat due to the patient's swallowing the solution.

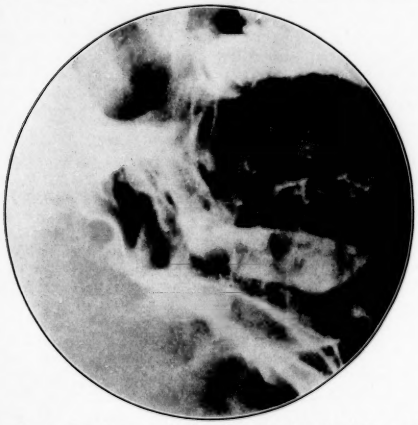

Fig. 4.—Lateral view of the skull taken with the subject, who was 8 years old, in a completely inverted position after 0.4 cc. of solution had been placed in each naris. The lower level of the column of radiopaque fluid is contiguous with the horizontal cribriform plate and curves anteriorly on the dorsum of the nose. The upper level is parallel to the cribriform plate (compare with figure 2 *B*).

CLINICAL EXPERIMENTS

Our studies indicate that the physical action of a lake of fluid in the olfactory area may be more efficacious than the action of a spray. In several cases 0.25 cc. of physiologic solution of sodium chloride was introduced into the olfactory groove by the method described. It was found that this small amount of solution may be largely removed after one minute if the head is kept in the inverted position. To accomplish this, we introduced a delicate No. 6 (2 mm.) ureteral catheter, on the end of a No. 22 needle, directly between the middle turbinate and the septum into the vault of the common nasal meatus. Gentle suction with this device recovered the greater portion of the fluid, hazy with shreds of mucus. This indicates that the lake of fluid probably loosens the mucous protective layer over the olfactory mucosa.

ROENTGEN STUDIES

Colloidal thorium dioxide (thorium dioxide sol, thorotrast) was used. The physical properties of this solution and those of a solution of 1 per cent zinc sulfate were found to differ not enough to interfere with experimental analogy. The colloidal thorium dioxide does not cause any discomfort in the nose, and children readily permitted experiments using it. It is easily blown out of the nose after the procedure is completed.

Studies were made on thirty subjects, twelve of whom were adults; the rest were children between the ages of 2 and 14 years. Repeated experiments were made in order to evaluate different positions, methods of application and the quantity of fluid necessary. At first the solution was placed directly to the olfactory area with a fine ureteral catheter and with the patient's head completely inverted, the base line of the skull being kept horizontal. Anteroposterior and lateral films taken after thirty seconds demonstrated that the radiopaque fluid filled the common meatus to a desired height. The result obtained by this method was satisfactory and was thereafter used as a standard in gaging the results obtained by simpler technics of application. Of these, the simple method described in the paragraph on procedure was shown to give accurate, selective filling of the inverted common meatus in all of the subjects.

Trials using the position in which the chin and ear line is vertical with seven children between the ages of 3 and 14 convinced us of the likelihood of filling by this technic the middle meatus and the sinus cells instead of the vault of the common meatus. In three cases part of the fluid was in the vault of the common meatus, but the fluid level resembled that illustrated in figure 2 *A*. As the completely inverted position is easy to obtain and does not lead to failures, we propose to use it and no other.

In the final trials small quantities of the radiopaque solution were placed in the nose by the method described in the section on procedure. Lateral films of the fluid column in position in the olfactory area show the lower, or cribriform, level to be quite straight, but the upper, or nasal, level is wavy because of capillarity and variations of width (fig. 4). The posterior projection shows the maximum height and width of the fluid column and is useful in demonstrating the selective manner by which the fluid attains the proper position (fig. 5).

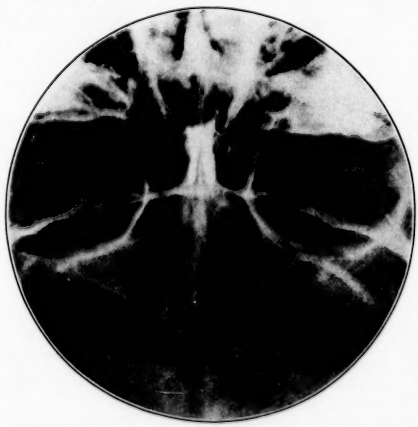

Fig. 5.—The same subject as in figure 4. Posterior projection of the skull in the completely inverted position shows the accurate and selective filling of the inverted common nasal meatus.

Each adult subject had a clinical examination of the nasal vault before the roentgen studies. Various grades of deviation of the septum and enlargement of the middle turbinate were noted. Yet in fifteen trials

with twelve adults, 0.25 cc. of the solution filled the inverted common nasal meatus to a satisfactory level. Preliminary shrinkage of the nasal mucosa was found unnecessary. The depth of filling averaged 14 mm.; in only one case was the height less than 11 mm. The maximum widths of the fluid columns averaged 1.5 mm. (from 0.5 to 3 mm.), exclusive of one much curved column and one measuring 4 mm. in one place and 1 mm. in another. In one third of the adults 0.25 cc. gave a little spilling over into the middle meatus and the sinus cells.

We found the method equally successful in the treatment of children. The superior portion of the common meatus is wider in younger children. This made it necessary to use a larger quantity of fluid to accomplish a desirable height of filling (approximately 0.4 to 0.5 cc.). Clinical examination showed structural deformities to be uncommon in children under 10 years of age. For these reasons the fluid column was easier to demonstrate in the lateral roentgenograms. Precise measurements of the volume necessary to cover the required area showed some variability. For instance, the meatus of one 8 year old child had a maximum width of 5 mm. and filled to only 7 mm. with 0.25 cc. and then up to 19 mm. when 0.25 cc. was added, yet there was no spilling over. A younger child, 20 months old, with a maximum width of 4 mm., filled to 18 mm. with 0.5 cc.

It is therefore evident that if one uses a volume so small that no fluid overflows in any of the subjects, then the meatus of some will fill to a height of less than 1 cm., which may let some of the olfactory membrane escape. To get sufficient height of filling in nearly all children, one will have to use about 0.5 cc. and let a portion spill over into the middle meatus in most of them.

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CONCLUSIONS

1. The success of this simple, safe, yet accurate method of applying solutions to the human olfactory area depends primarily on the complete inversion of the head, with the base line of the skull horizontal, and the slow introduction of the fluid along the inner surface of the dorsum of the nose at the vestibular margin.

2. The approximate quantity of fluid necessary to immerse adequately the olfactory membrane by this method has been determined. Five-tenths cc. for children under 10 years, 0.4 cc. for those between 10 and 14 and 0.25 cc. for adults is probably sufficient; a portion of the fluid will overflow in some of the subjects. We have stressed the quantity of fluid to be used because we feel that distress after treatment with chemical agents may thus be minimized.

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Urban Civilization and Physical Deteriorization.—With the development of urban civilization and industry, physical deterioration becomes appallingly common. All sorts of pathologies multiply; enlarged communications bring new and virulent infections; every sort of physical abnormality is increasingly prevalent. The biological status of man seems to decline as his culture accelerates. Medical science intervenes and becomes efficacious in the reduction of suffering and the prolongation of life, but, unfortunately, also in the preservation of the malformed, the chronically diseased, and the biologically inferior.—Hooton, E. A.: Apes, Men, and Morons, New York, G. P. Putnam's Sons, 1937, page 293.

NONOPERATIVE MANAGEMENT OF REMAINING COMMON DUCT STONES

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AND
N. FREDERICK HICKEN, M.D.
OMAHA

During the last few years we have taken many immediate cholangiograms at the operating table and have adopted the rule of making delayed studies in all cases of common duct drainage or biliary fistula. These series of follow-up cholangiograms have added inestimably to our knowledge of the pathologic physiology of the extrahepatic biliary tract. In our earlier investigations we used an iodized oil as the contrast medium but have since come to believe that the heavy oil obscures the smaller stones. Colloidal thorium dioxide (thorium dioxide sol, thorotrast) is an excellent radiopaque solution, but until certain controversies about its potential dangers are settled we have discontinued its use. From our own experience, dating

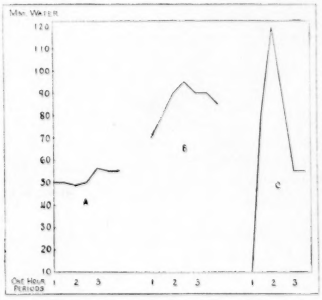

Fig. 1.—These measurements of intraductal pressure in a case with T tube in the common duct contrast the height of pressure in control periods with the pressure following administration of dehydrocholic acid.

back three years, we have no regrets and do not believe that colloidal thorium dioxide carries any hazard. We have used a 48 per cent solution of hippuran almost as a matter of routine for the past eighteen months, with gratifying results.

Much to our surprise, we have not infrequently found delayed cholangiograms to reveal stones or foreign bodies such as blood clots, organized débris or inspissated bile in common ducts which were thoroughly explored by palpation, probing, scooping, irrigation and suction at the time of operation. Thus it has been forcibly brought to our attention that these foreign bodies may be left within the duct or may be washed down from the liver. In the past we have not been sufficiently cognizant of the series of events which takes place in the common duct after surgical treatment of the biliary tract. It can be fully appreciated only by those who have determined the postoperative status of the common duct through cholangiography. With this situation in mind, and fully aware of the mortality attending secondary attacks on the biliary tract, we have attempted to dislodge some of these foreign bodies by various nonoperative measures.

From the departments of surgery and anatomy, University of Nebraska College of Medicine.

The first problem is to provide a free exit at the lower end of the common duct through which the foreign elements may pass into the duodenum. The sphincter of Oddi guards this portion of the duct and is probably associated with a pseudosphincter action of the muscular fibers of the duodenal wall itself. If not in an absolute state of relaxation, this sphincter mechanism may prevent the egress of the contents of the common duct. It is often found to be unrelaxed and not infrequently is definitely spastic. This motor dysfunction of the lower end of the common duct has been mentioned often in interesting articles by Westphal,[1] Newman,[2] Ivy and Sandblom[3] and various others. In 1935 we demonstrated by means of cholangiograms that an unrelaxed or spastic state of the sphincter area could exist in human beings.[4] In 1936 Walters and his group[5] reported their experiments on common duct pressure as affected by spasm of the sphincter. We have also studied the effects of various drugs on this phenomenon and at the annual session of the American Medical Association in 1936 presented a paper[6] on cholangiography and biliary dyssynergia in which the use of glyceryl trinitrate was proposed; cholangiograms proved that in many instances the sphincter of Oddi immediately relaxed after 1/100 grain (0.0006 Gm.) of glyceryl trinitrate was placed beneath the tongue, for the contrast solution readily entered the duodenum.

Fig. 2 (case 1).—This cholangiogram, taken some weeks after operation, reveals the rounded margin of a stone blocking the lower end of the common duct and the pancreatic duct. Repetition of the injection and a roentgenogram confirmed its presence.

In the course of these investigations it was noticed that morphine did not produce relaxation and that atropine was not constant in its effects. The reports of Walters and his group on biliary pressure substantiate this observation. They also found that amyl nitrite and glyceryl trinitrate decrease biliary pressure by relaxing the sphincter of Oddi and that morphine causes increased pressure through contraction of the sphincter muscle. Even more recently, Doubilet and Colp[7] have corroborated the effects of glyceryl trinitrate and morphine by further pressure studies. In addition, they have shown that atropine may lessen the tension in the irritable area around the sphincter, which observation concurs with our cholangiographic data. We have observed, with the aid of cholangiograms, that magnesium sulfate on the duodenal side of the choledochal sphincter assists the contents of the common duct to pass more freely into the duodenum. This seems to be true of olive oil as well. We have also reported on the apparent soothing or relaxing effect of warm olive oil or iodized oil when applied to the choledochal side of the sphincter of Oddi through a T tube or fistula.

Since the sphincter may or may not be spastic in the event of a remaining stone in the common duct, the second step in dislodging the foreign body is increasing the pressure behind it. This is easily accomplished by injecting saline solution, olive oil or iodized oil through the drainage tube or fistula if the foreign body is below their level. If, however, these smaller particles are lodged above the opening of the tube or fistula, they may be forced higher into the hepatic duct or into the larger biliary radicles within the liver. Again, after these higher stones are once dislodged, they may find their way down to the lower end of the common duct. It is also conceivable that increasing the flow of bile by stimulating its formation will augment the intraductal pressure. Neubauer[8] in 1925 determined by experiments on animals and human beings that sodium dehydrocholate, the sodium salt of dehydrocholic acid, increased the secretion of bile. We have therefore been experimenting with pressure changes as affected by dehydrocholic acid, and although we are not reporting in detail in this paper, we are able to say that the flow of bile and the intraductal pressure are heightened after administration of either decholin or procholon, the commercial products of dehydrocholic acid (fig. 1). This added pressure is of greatest value when the foreign body is below the inlet of the T tube, catheter or fistula in the common duct, as it tends to force the impediment through the sphincter during some momentary period of relaxation. The normal intraductal pressure varies with different cases but the usual pressure is somewhere between 50 and 125 mm. of water[9] in postoperative cases. The resistance of the sphincter or breaking point is 150 mm. Doubilet and Colp[7] have only recently reported cases showing variations in the resistance of the sphincter and the effects of different drugs on this area. These variations were most con-

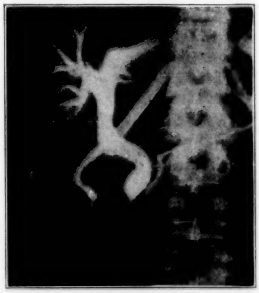

Fig. 3 (case 1).—The described management was instituted, but only after repeated attempts over a two months period was a plate obtained which showed the stone to have disappeared. Evidently swelling and edema had to subside before dislodgment could be accomplished. Repeated check-ups confirmed the disappearance of the stone. The pancreatic duct is still visible.

1. Westphal, Karl: Muskelfunction, Nervensystem und Pathologie der Gallenwege: I. Untersuchungen über den Schmerzanfall der Gallenwege und seine ausstrahlenden Reflexe, Ztschr. f. klin. Med. **96:** 22-150 (Jan.) 1923.

2. Newman, Charles: Physiology of the Gallbladder and Its Functional Abnormalities, Lancet **1:** 785 (April 14), 841 (April 22), 896 (April 29) 1933.

3. Ivy, A. C., and Sandblom, Philip: Biliary Dyskinesia, Ann. Int. Med. **8:** 115-122 (Aug.) 1934.

4. Best, R. Russell, and Hicken, N. Frederick: Biliary Dyssynergia: Physiological Obstruction of the Common Bile Duct, Surg., Gynec. & Obst. **61:** 721-734 (Dec.) 1935.

5. Walters, Waltman; McGowan, J. M., and Butsch, W. L.: Pressure in the Common Bile Duct of Man: Its Relation to Pain Following Cholecystectomy, J. A. M. A. **106:** 2227-2230 (June 27) 1936.

6. Best, R. Russell, and Hicken, N. Frederick: Cholangiographic Demonstration of Biliary Dyssynergia and Other Obstructive Lesions of the Gallbladder and Bile Ducts, J. A. M. A. **107:** 1615-1619 (Nov. 14) 1936.

7. Doubilet, Henry, and Colp, Ralph: Resistance of the Sphincter of Oddi in the Human, Surg., Gynec. & Obst. **64:** 622-633 (March) 1937.

8. Neubauer, E.: Cholagogues, Klin. Wchnschr. **4:** 926 (May 7) 1925; Gallensekretionssteigerung und Gallenentleerung, Wien. Arch. f. inn. Med. **18:** 365 (Oct.) 1929.

9. Higgins, G. M., and Mann, F. C.: A Physiologic and Anatomic Consideration of the Sphincter Mechanism of the Choledochus, Anat. Rec. **35:** 13 (March 25) 1927. Kitakoji, Yoshihar: Studien über die Funktionen der Gallenblase und des Oddischen Muskels in Bezug auf die Absonderung der Blasengalle, I. Mitteilung: Ueber den Einfluss von Nervengiften auf die Funktionen der Gallenblase und des Oddischen Muskels, Nagoya J. M. Sc. **5:** 24-29 (Nov. 20) 1930.

spicuous in our early cholangiographic studies,[10] ranging from complete relaxation to complete spastic occlusion and even resulting, in one instance, in acholic stools over a period of weeks. Edema or inflammation in this region will tend to narrow the outlet further.

The following case illustrates the possibility of dislodging a stone from the common duct by the aforementioned method, after the edema in the sphincter area has subsided:

History.—O. M., a man, aged 35, had recurrent attacks of indigestion for sixteen months, accompanied by pain in the upper part of the abdomen, nausea and vomiting. Morphine was required for relief, and on one occasion he became slightly jaundiced. The week before he entered the hospital he had a severe pain in the upper part of the abdomen which required several injections for relief, and within three days he became icteric. When examined, the patient was very apprehensive, definitely jaundiced and moderately tender over the gallbladder. His icteric index was 75, the van den Bergh direct delayed reaction was moderately positive, the stools contained bile, the temperature was 99.8 F. and the leukocyte count was 10,600. By conservative management the icteric index was brought down to 35, and after five days of observation and preparation the patient was operated on; the diagnosis was cholecystitis, cholelithiasis and stone in the common duct.

First Operation.—With the patient under spinal anesthesia, the gallbladder, thick walled, definitely inflamed and adherent to surrounding structures, was removed. The common duct was about twice normal size and was angulated at its junction with the cystic duct by inflammatory adhesions. These were freed and the duct was opened. Thorough palpation, probing, scooping and washing revealed no stone. The head of the pancreas was thickened and harder than normal. A T tube was placed in the common duct for drainage.

On the sixth postoperative day a cholangiogram was made by injecting 20 cc. of hippuran solution into the common duct through the T tube. No stone was visible, but the sphincter was contracted. This spasm was relaxed by dissolving $\frac{1}{100}$ grain of glyceryl trinitrate beneath the patient's tongue. The T tube was removed on the tenth postoperative day after a check-up cholangiogram, which again revealed some sphincterismus but no stone. The patient was discharged from the hospital a few days later to the care of his local doctor, with a remaining biliary fistula. During the next two months he had continued attacks of chills, fever, distress in the upper part of the abdomen and intermittent jaundice. The sinus tract would close, only to reopen and drain pus and bile. This process recurred a number of times.

About ten weeks after the first operation, another cholangiogram, made by injecting 20 cc. of hippuran solution into the fistulous tract, revealed two stones in the common duct which had not been visible on the previous plates. Operation was advised.

Second Operation.—Several days later an attempt was made to locate and remove the stones from the enlarged common duct. The head of the pancreas was also larger than normal, hard and irregular, as is consistent with marked chronic pancreatitis or new growth. There was a pronounced inflammation around the common duct and the duodenum. The duct was explored as thoroughly as possible in the presence of this inflammatory reaction, finger, probe, scoop, irrigation and suction being used, but no stone could be located or dislodged. By this time the patient's condition was unsatisfactory, contraindicating a transduodenal attack. Therefore a T tube was hurriedly placed in the common duct and the abdomen was closed.

Because of digestion of the tissues around the wound, a cholangiogram was not taken for three weeks, at which time the picture was a little suggestive of a single stone remaining in the ampulla. A recheck four weeks later definitely revealed a stone at the lower end of the common duct (fig. 2). The entire length of the pancreatic duct was easily seen on this plate.

A three day regimen with dehydrocholic acid and antispasmodic drugs was instituted and repeated every ten days. In the intervals the duct was washed out on alternate days with sterile olive oil or lipoiodine. With each oil irrigation, $\frac{1}{100}$ grain of glyceryl trinitrate was placed beneath the tongue.

A follow-up cholangiogram, one month after institution of this treatment, showed the stone still present, but the dye entered the duodenum more readily. After a second month of treatment no evidence of a filling defect could be found at the lower end of the common duct (fig. 3).

The T tube was then clamped off, except at night, for another thirty days, when a recheck showed no indication of a stone in the common duct.

This confirmation warranted removal of the T tube, and now, eight months later, the patient weighs more than he ever did, feels perfectly well and is back at his regular duties.

Evidently, in this case, drainage of the common duct and time were needed for the subsidence of the pancreatic inflammation, and then proper measures caused the stone to be dislodged.

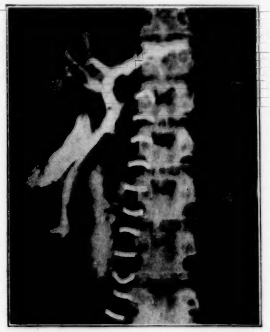

Fig. 4 (case 2).—This cholangiogram was made one week after operation. Multiple round filling defects are visible in the common duct. The duct is still patent, as the hippuran solution can be seen in the duodenum.

Fig. 5 (case 2).—After the described treatment, ten stones were recovered from the stools. The cholangiogram reveals one more stone remaining at the lower end of the common duct.

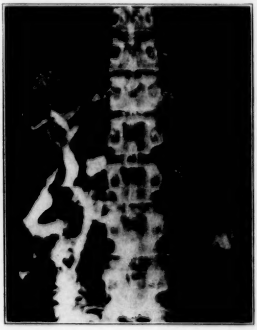

Fig. 6 (case 2).—After another course of treatment, this stone was recovered from the stool, and the cholangiogram reveals no more stones in the common duct.

10. Hicken, N. F.; Best, R. R., and Hunt, H. B.: Cholangiography: Visualization of the Gallbladder and Bile Ducts During and After Operation, Ann. Surg. **103**: 210-229 (Feb.) 1935. Best and Hicken, footnotes 4 and 6.

We have come to believe that stones are present in the larger biliary ducts of the liver more frequently than is recorded. More detailed examination of the liver at autopsy would support this statement, for during the last year we have demonstrated such stones in two instances but only after thorough search through the liver. One patient had a postoperative stone in the common duct and also unrecognized carcinoma of the kidney. The other patient was one on whom a routine autopsy was performed after he had died of cardiovascular disease.

The following case is presented because it more definitely substantiates the release of intrahepatic stones into the common duct. These stones were detected in the common duct by cholangiograms and then were successfully dislodged by the regimen described.

CASE 2.—*History.*—For five years R. F. C., a married woman, aged 28, had been having attacks of nausea and vomiting which were associated with loss of appetite, slight distress in the upper part of the abdomen but no true pain. Removal of her appendix did not alleviate the symptoms but rather the attacks became more frequent. Three days before entering the hospital she was suddenly seized with a sharp pain in the right upper quadrant, which radiated to the right scapular region. The paroxysm subsided after the administration of morphine. She presented no history of jaundice, but

Fig. 7 (case 2).—The group of ten stones were recovered from the stool after the first course of treatment. The single stone was recovered after the second course.

for some years she had noticed a sensation of pressure immediately after meals, which would last for half an hour and was not relieved by sodium bicarbonate.

Examination revealed a well developed young woman in no apparent distress. The only positive evidence was slight tenderness over the gallbladder. No rigidity and no definite masses were palpable. Her temperature and pulse were normal; the white blood count was 10,400 and the icteric index 10.

Operation.—The large, distended gallbladder was adherent to the duodenum. The common duct appeared two or three times normal size, with no stones palpable in its lumen. After the gallbladder was removed, it was incised and found to contain about 200 pea-size stones. The common duct was opened through the stump of the cystic duct, but palpation, probing, scooping, suction and irrigation revealed no stones. A catheter was then placed in the common duct and the abdomen was closed.

One week after operation a cholangiogram made with 20 cc. of hippuran solution revealed multiple pea-size stones in the common duct (fig. 4). A cholangiogram made several days later gave the same picture.

Nonoperative Measures.—As soon as the patient's condition warranted it, the previously described therapeutic measures were begun. After the first course of treatment ten stones were recovered from the stools. The cholangiogram was repeated and one stone was found remaining in the ampulla (fig. 5). A second course of treatment resulted in passage of the eleventh stone (fig. 6). Two subsequent check-ups gave negative results (fig. 7). The fistula soon closed, and now, eight months later, the patient feels perfectly well.

We have been able to depict apparent foreign bodies in two other common ducts by postoperative cholangiograms, but these defects were inconstant in appearance as well as irregular in shape. It is highly possible that they were small blood clots or lumps of inspissated bile which were later dislodged. In any event, they disappeared under the described treatment. In a recent case, although no stone could be palpated, the postoperative cholangiogram revealed a large stone within the common duct. Repeated efforts to dislodge it have been ineffectual, and ether has also failed to break it up. Another operation is to be advised.

SUGGESTED TECHNIC FOR REMOVAL OF REMAINING COMMON DUCT STONES

When a stone is located in the common duct by delayed cholangiography, the following three day regimen is begun: On the first day a $\frac{1}{100}$ grain tablet of glyceryl trinitrate is placed under the tongue three times during the day; on the second, $\frac{1}{100}$ grain of atropine is given either by mouth or hypodermically three times, and on the third the administration of glyceryl trinitrate is repeated. Each morning the patient is given 2 drachms (8 Gm.) or more of magnesium sulfate in warm water and each evening at bedtime one ounce (30 cc.) of olive oil (preferably) or thick cream. The common duct is gently irrigated once a day through the T tube, catheter or fistula, with warm physiologic solution of sodium chloride, and after as much of this as possible is removed by syringe or by permitting the tube to drain for five minutes, from 10 to 30 cc. of warm sterile olive oil or lipoiodine is instilled into the common duct. If the patient does not complain of distress, the tube should be clamped off during this course of treatment except for a thirty minute period after each instillation. In order to maintain an increased intraductal pressure, three or four tablets of dechólin or procholon are given four times a day.

This treatment may be repeated after a few days' rest, and, as in the first case reported, it may be repeated as many as ten times over a period of two months. It may prove rather debilitating at times, and care must be taken not to exhaust the patient.

The question arises as to the indications for this form of treatment when no fistula or arrangement with a catheter exists. If obstruction is complete, there may be danger of hastening hepatic destruction by increasing the biliary pressure. In several cases in which obstruction has not been complete, we have ventured to use the treatment, omitting the irrigations, with no evident harmful effects and with definite improvement or complete alleviation of the biliary condition. We have recovered no stones from the stools as yet in such instances, but the patient's search for stones at home is not so exacting. One should always be aware of the potential danger in such treatment, however, and until further investigative studies have been made, the dehydrocholic acid products should be cautiously prescribed when there is any degree of jaundice with supposition of stone in the common duct. If the jaundice is marked, with acholic stools, great damage might be done to the liver, and dehydrocholic acid should definitely not be prescribed. However, in all

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cases following cholecystectomy in which jaundice does not exist, we now place the patient on the described three day regimen about two weeks after operation in an effort to flush the biliary system thoroughly and remove small stones, mucous plugs, inspissated bile and organized débris, thus lessening the incidence of postcholecystectomy difficulties. This particular regimen is now being used in the nonsurgical management of routine biliary tract disease, exclusive of jaundice.

527 Medical Arts Building.

ADIPOSIS DOLOROSA (DERCUM'S DISEASE)

TREATMENT OF THE ASTHENIC PHASE WITH PROSTIGMINE AND AMINOACETIC ACID

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AND
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If one is to judge from the number of cases reported in the literature, adiposis dolorosa is a rather rare disease. Approximately 250 cases have been described in the world's literature since the original report of the condition by Dercum in 1888. It would seem that the infrequent occurrence of the disease is more apparent than real. Many cases are unrecognized as such and masquerade as endocrine obesity associated with arthritis or menopausal psychosis. Moreover, there has been a tendency in recent years, particularly on the continent, to deny the existence of Dercum's disease as a clinical entity. From a critical review of the literature and our studies of the cases to be described here, we are inclined with Laroche [1] to look on it as a syndrome rather than as a disease per se.

The four cardinal signs of Dercum's syndrome are (1) adiposity, (2) asthenia, (3) pain and (4) psychic disturbances. The asthenia is usually out of proportion to all physical activities. The least amount of effort to which the patient has been accustomed fatigues him readily. Sooner or later the asthenia becomes so pronounced as totally to incapacitate the patient. This symptom overshadowed all other complaints by our patients and taxed our therapeutic resources. The other signs of Dercum's disease will receive due consideration in the discussion of the cases. In this presentation we are reporting three cases in which the asthenia was an outstanding feature. This symptom of the disease was combated successfully by the oral use of aminoacetic acid and prostigmine ammonium bromide. To our knowledge this therapeutic regimen was never before employed in Dercum's disease.

REPORT OF CASES

CASE 1.—MRS. B. H., aged 60, white, admitted to the Endocrine Clinic of Temple University Hospital March 17, 1936, complained of pains in both legs, extreme weakness and frequent crying spells without any apparent reason. She gave a history of progressive gain in weight, her highest weight having been 230 pounds (104 Kg.) two years previously. The patient is married and has two children, both living and well. She was not a heavy eater and had no excessive desire for sweets or fluids. The past history was irrelevant except that in 1934 she was treated in another institution for hypopituitarism.

On examination she was found to be very nervous and depressed; her skin was dry and of a rather pasty color. There was a universal distribution of fat, with a predominance over the hips, thighs and abdomen. The arms and legs were thin. There were pads of fat around the metatarsal bones of each foot. There were encapsulated masses of fat on the thighs and hips. These masses were painful on pressure. Physical examination of the chest was negative and the lungs were clear; there was no evidence of heart disease. The blood pressure in millimeters of mercury was 120 systolic and 80 diastolic. The abdomen was pendulous; there were several fatty, tender nodules in the abdominal wall. The edge of the liver was not palpable. The spleen was not enlarged. The tendon reflexes were exaggerated. The visual fields were normal; the fundi were not clearly visualized; bilateral immature cataracts were found. The only abnormal laboratory finding was a basal metabolic rate of minus 25 per cent with a blood cholesterol of 138 mg. per hundred cubic centimeters. The sugar tolerance curve was within normal range. The blood calcium content was 11 mg. per hundred cubic centimeters, the blood phosphorus 4 mg. Urinalysis on two occasions revealed no chemical or microscopic abnormalities. The specific gravity varied from 1.006 to 1.013 The blood count showed hemoglobin 75 per cent (Dare), red blood cells 4,410,000, white blood cells

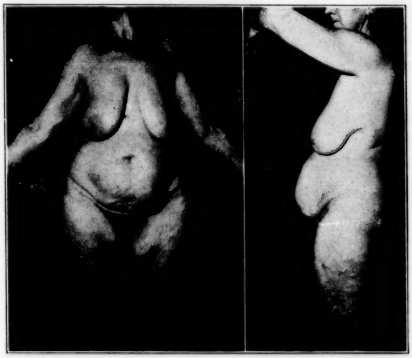

Fig. 1 (case 1).—Adiposis dolorosa. Note lumpy, encapsulated masses of fat on thighs and abdomen, forming an overhanging apron of fat. The upper half of the body is relatively thin (after weight loss of 10 Kg.).

6,000, color index 0.85 and normal erythrocytes. X-ray examination of the skull showed a normal sella turcica. X-ray examination of the chest showed no persistent thymus.

Treatment consisted of a diet with 70 Gm. of protein, 100 Gm. of carbohydrates and 75 Gm. of fat. Because of the question of hypothyroidism as the cause of her condition, she was placed on desiccated thyroid, 1½ grains (0.1 Gm.) daily. In the course of seven months she lost 22 pounds (10 Kg.). The basal metabolic rate October 29 was minus 10 per cent. Her weakness and nervousness persisted. In view of the fact that the blood picture was still that of hypochromic anemia, she was given iron sulfate 15 grains (1 Gm.) daily. The blood picture improved but the patient still continued to complain of weakness, nervousness and depression. The weakness was so distressing that she was forced to stay in bed until midday each day. The least physical effort fatigued her. The tenderness of the lipomatous nodules persisted, and nervousness and irritability increased.

Because of the extreme muscle weakness it was thought that there was also a component of myasthenia gravis. The reaction of the sternocleidomastoid muscle to the faradic cur-

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These studies were made possible by the cooperation and aid extended by the various members of the medical staff of Temple University Hospital.

1. Laroche, Guy: Adipose douloureuse et maladie de Dercum, Ann. de méd. **23**: 445-453 (May) 1928.

rent stimulation by Dr. G. E. Farrar Jr. was as follows: Faradic stimulation of the sternocleidomastoid muscle, at the rate of about 25 muscle contractions per minute, showed weakening at 50 contractions. After 0.5 cc. of 1:2,000 solution of prostigmine intramuscularly, muscle contractions weakened at 450 contractions. The extensor indicis proprius muscle was exhausted at 50 contractions. After 1 cc. of prostigmine intramuscularly, the response was as follows: ten minutes, 250 contractions without fatigue; one hour, two hours, three hours, 300 contractions without fatigue. The patient was given 45 mg. of prostigmine daily by mouth. For six weeks she did fairly well. She returned to the clinic after she recovered from an infection of the upper respiratory tract which lasted five days. The weakness and nervousness recurred. Prostigmine was continued for ten days. The benefit from it was not as great as when it was first given. The urine was examined for creatine and showed 70 mg. in twenty-four hours on her usual mixed diet. Prostigmine was combined with aminoacetic acid 15 Gm. daily. In the following three months there was a distinct improvement. The urine showed 86 mg. of creatine in twenty-four hours. She felt considerably stronger, her nervousness decreased and she was able to carry on her routine daily household work. She is well maintained on aminoacetic acid and prostigmine orally. The urine after four months of combined therapy showed 130 mg. of creatine.

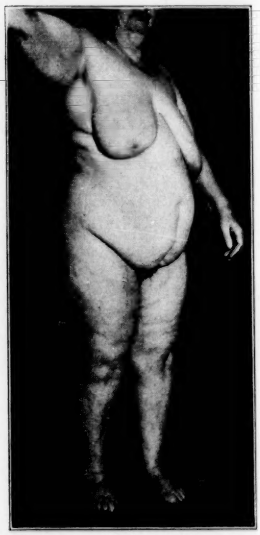

Fig. 2 (case 2).—Illustrating generalized diffuse form of Dercum's disease.

CASE 2.—Mrs. E. Z., aged 49, white, admitted to Temple University Hospital, April 21, 1937, complained of generalized body pains; they were worse in the legs and knees. The pains were especially severe over masses of subcutaneous "knots." The pains had been of several years' duration and had grown worse in the last few months. She also suffered from weakness and "hot flashes," periods of depression and "unexplained crying." She had put on considerable weight in the last few years, having reached her admission weight of 226 pounds (102.5 Kg.). Her past history was irrelevant except that she underwent a pelvic operation in 1923. This was followed by a decreased menstrual flow and, six years later, vasomotor symptoms developed; namely, hot flashes and sweats. Pains in the legs and the arms and in "lumpy" areas of the body came on about this time. Extreme weakness had appeared in the last two years so that the patient spent a great deal of time in bed.

The patient was well oriented, easily excitable, nervous and obese. The obesity was universal in distribution but predominated over the abdomen, thighs, buttocks and arms. The face was florid, the mammae were pendulous, and the skin of the body was of fine texture, warm and moist and showed prominent dermatographism. There were subcutaneous masses of fat, varying in size from an English walnut to an orange, well distributed over the abdomen, chest and arms; they were tender to pressure. The pubic and axillary hair was scanty. There were varicosities on both legs as well as fatty nodules, smaller than those found on the arms. The nodules were tender to touch. There was also marked tenderness around the knees and especially in the popliteal spaces, which were padded with collections of fatty masses. Examination of the heart showed a transverse widening with distant sounds. No murmurs were heard and no arrhythmia was found. The aorta was widened; the aortic second sound was accentuated and roughened. The blood pressure was 170 systolic, 110 diastolic, and the pulse rate was 84. The electrocardiogram showed normal sinus rhythm. The lungs were emphysematous. The abdominal viscera could not be palpated because of the pendulous abdomen. Polyneuritis was excluded by Dr. S. F. Gilpin Jr. The examination of the eyes by Dr. W. J. Lillie showed slight attenuation of retinal vessels; the visual fields were normal.

The various laboratory studies were as follows: hemoglobin 85 per cent (Dare); red blood cells numbered 4,670,000, white blood cells 12,300: polymorphonuclear leukocytes 85 per cent, lymphocytes 15 per cent. There were no abnormal red cells. Urinalysis revealed: acidity, specific gravity 1.019, sugar and albumin negative, occult blood negative, microscopic examination negative. Blood chemistry revealed: serum calcium 9.9 mg. per hundred cubic centimeters of blood, phosphorus 4.8 mg., cholesterol 170 mg., urea 13 mg., sugar 93 mg. The Wassermann reaction of the blood (Kolmer and Kahn modifications) was negative. The basal metabolic rate was plus 9 per cent.

Pachon oscillometric readings revealed normal conditions in both calves and ankles. X-ray examination of the sella turcica showed the pituitary fossa to be slightly larger than average. The lateral film of the skull showed no evidence of increased intracranial pressure.

During her stay at the hospital, the patient complained of severe pains in the shoulders, legs and abdomen. On one occasion, the pains were so severe that a hypodermic administration of morphine had to be resorted to. The question of focal infection with arthritic changes was considered. Clinical and x-ray studies of all the teeth and the joints of the upper and lower extremities were negative. The shafts of the left femur and fibula were normal in appearance. Dr. J. R. Moore excluded any orthopedic condition that would be responsible for her pains. The pains were therefore attributed to her metabolic disorder. She was discharged with the diagnosis of Dercum's syndrome and was referred to the Endocrine Clinic. On her visits to the clinic she still complained of pains and marked weakness. Because of her extreme exhaustion and our experience with prostigmine and aminoacetic acid in case 1 she was tested by Dr. Farrar for myasthenic reaction of the muscles. He found a marked improvement in contractions of the left sternocleidomastoid muscle (faradic current stimulation) after intramuscular injection of 1 cc. of 1:2,000 solution of prostigmine.[1a] The patient was placed on a diet consisting of 70 Gm. of protein, 100 Gm. of carbohydrate and 70 Gm. of fat. She was given 15 mg. of prostigmine orally three times a day. For the pains and nervousness analgesics in the form of acetylsalicylic acid and phenobarbital were given with satisfactory results. The weakness, however, persisted, although not so pronounced. Aminoacetic acid 7 Gm. daily was added. The weakness disappeared in the course of twenty-four days. The vasomotor phenomena were combated by sedatives and intramuscular injections of estradiol benzoate. After four months of treatment, the patient lost 40 pounds (18 Kg.) and was able to carry on her usual household duties. Prior to administration of aminoacetic acid the urine contained 0.23 Gm. of creatine for twenty-four hours. Five months later it showed a creatine content of 0.27 Gm. After omission of aminoacetic acid for a period of one month, the twenty-four hour urine creatine rose to 0.330 Gm. After this treatment had been resumed for three weeks, the twenty-four hour urine creatine decreased to 0.242 Gm. It is interesting to note that during her treatment, and while she was losing weight, three attacks of epigastric discomfort developed with pains in the right

1a. Muscle fatigued at ninety contractions—twenty-five muscle contractions per minute; after 1 cc. of 1:2,000 solution of prostigmine intramuscularly, muscle showed no fatigue after 150 contractions and upward.

upper quadrant simulating gallbladder disease. A cholecystogram showed no evidence of an opaque or nonopaque calculus in the gallbladder and a normally functioning gallbladder. Biliary drainage, however, showed many cholesterin crystals in the bile sediment. The upper abdominal pains cleared after several biliary drainages.

CASE 3.—Mrs. A. T., aged 48, admitted to Temple University Hospital June 17, 1937, complained mainly of weakness of the back and the legs, pain in the right hip and increasing weight. Her previous health had been good until three years before, when she noticed that her strength was decreasing and that she had no "support" in her back. She had great difficulty in sitting up from a recumbent position and had to hold on to something to pull herself up. The pain in the right hip region, particularly when lying on this side, she had had for three years. She had typhoid at the age of 15 years and a nervous breakdown nine years before admission. She was married and had had four pregnancies. The first infant died shortly after birth. Her three boys were vigorous at this time.

Her menstruation was regular and of normal flow. She weighed 175 pounds (79.4 Kg.) and was 5 feet (152 cm.) in height. The fat was universally distributed, with lipomatous masses about the hips and subtrochanteric areas. These fatty masses were very tender on pressure. There were many tender nodules, smaller in size, scattered over the thighs and arms, suggesting "bag of worms feel," as described by Dercum.[2] There was weakness of the back and leg muscles, particularly of the psoas iliacus group. No fibrillary twitchings of the muscles were noted. There was a marked lumbar lordosis. On her attempt to rise from the floor, the patient rotated her whole body, getting on "all fours." The neurologic examination by Dr. S. F. Gilpin Jr. revealed no central or spinal cord involvement. The visual fields and retinas were normal. Examination of the chest showed no evidence of heart disease. The lungs were clear. The blood pressure in millimeters of mercury was 110 systolic and 80 diastolic. The abdomen was negative except for the presence of an apron of fatty tissue containing isolated, tender, lipomatous nodules. The pelvis was normal. The Wassermann and Kahn reactions of both the blood and the spinal fluid were negative. The colloidal gold curve of spinal fluid was negative. The basal metabolic rate was plus 6 per cent, the blood cholesterol was 165 mg. per hundred cubic centimeters of blood; blood calcium was 12 mg. and blood phosphorus 4.4 mg. The fasting value of the blood sugar was below normal (78 mg.). The sugar tolerance test showed an increased tolerance for carbohydrates. The blood count was: hemoglobin 13 Gm. per hundred cubic centimeters of blood, red blood cells 5,060,000, white blood cells, 10,500: polymorphonuclear leukocytes 54 per cent, lymphocytes 33 per cent, monocytes 12 per cent and eosinophils 1 per cent. The red blood cells were normal. Urinalysis: reaction, p_H 7.0; specific gravity, 1.010; albumin, slight trace; sugar, negative. Occult blood was slightly positive. An occasional red blood cell was present and an occasional white blood cell, with many bacteria. X-ray examination of the skull showed a normal sella. X-ray examination of the chest revealed no pathologic changes. The faradic stimulation of the left extensor indicis proprius muscle showed no myasthenic reaction. A twenty-four hour specimen of urine contained 0.869 Gm. of creatinine and 0.071 Gm. of creatine.

The patient was placed on a diet of 1,500 calories, with aminoacetic acid 10 Gm. and prostigmine 45 mg. daily. After ten days' treatment the patient's fatigability decreased and she had a feeling of general well being. After two months her general strength increased to such an extent that she was able to attend to light household duties; however, the lumbar muscle group was not beneficially affected. At the present time she is taking 15 Gm. of aminoacetic acid daily, which is apparently her maintenance dose.

This represents a case in which the symptoms of adiposis dolorosa were complicated by symptoms suggesting muscular dystrophy. Aminoacetic acid appeared to be of benefit for the relief of the asthenia.

2. Dercum, F. X., cited by Wohl, M. G., and Pastor, Nathan: Adiposis Dolorosa, Cyclopedia of Medicine, Philadelphia, F. A. Davis & Co., 1938.

COMMENT

The diagnosis of adiposis dolorosa in many instances is a difficult one. It is based on the presence of painful nodular obesity associated with asthenia and psychoneurotic manifestations. In cases 1 and 2 the clinical picture was fairly definite. In case 3, in addition to the adiposis dolorosa syndrome, the element of progressive muscular dystrophy is strongly to be entertained. That the nodules are not those of von Recklinghausen's disease is indicated by the fact that, in the latter, they are smaller and firmer and they follow along the course of nerve trunks. A biopsy of fatty nodules in cases 2 and 3 showed them to consist of fatty tissue. Myxedema is not to be considered, since in cases 2 and 3 the basal metabolic readings were above normal and the blood cholesterol estimation gave low figures. In case 1 the basal metabolic rate was minus 25 per cent; however, the blood cholesterol was 138 mg. per hundred

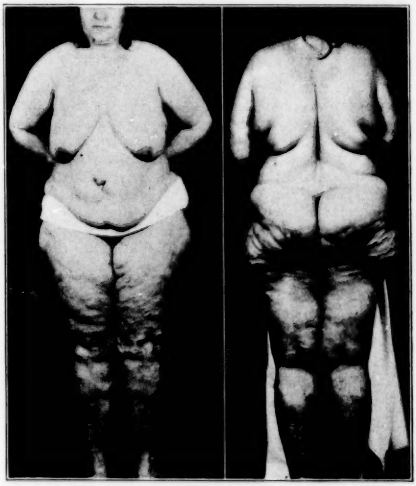

Fig. 3 (case 3).—Patient presenting nodular type of Dercum's disease.

cubic centimeters; then again she presented painful fatty nodules and she failed to improve when placed on sufficiently large doses of desiccated thyroid, which raised the basal metabolic rate to practically a normal level. Adiposis dolorosa has frequently been associated with a hypopituitary state, as in case 1. The low basal metabolic rate is to be looked on as conditioned by the latter endocrinopathy.

The peculiar reaction of the sternocleidomastoid and the extensor indicis proprius muscles to the faradic current stimulation raises an interesting question of the coexistence of an abnormal muscle metabolism not unlike that seen in myasthenia gravis. This view finds support in the fact that, after intramuscular use of prostigmine, muscle contractions could be elicited for a longer period before weakening than prior to the administration of prostigmine. The response of the muscles to the injection of prostigmine has been striking. This immediate improvement following a single injection of prostigmine is characteristic of myasthenia

gravis, according to Harvey and Whitehill.[3] It was shown by Folin [4] and later by Klercker [5] that the normal adult excretes no creatine or only a very small amount, especially in the case of the female. In certain myopathies, however, creatine in the urine is materially increased.[6] Tripoli [7] and Remen [8] observed creatinuria in myasthenia gravis. Edgeworth [9] states that a creatinuria and a lowered excretion of creatinine are found in this disease. In this connection the high creatine values in our cases are significant. Aminoacetic acid is known to play an important role in creatine metabolism. According to Boothby [10] it is of definite benefit in myasthenia gravis. The marked

Results of Laboratory Observation in Cases of Adiposis Dolorosa

Patient	Sex	Age	Basal Metabolic Rate	Chemistry of Blood in Milligrams per 100 Cc.				Creatine 24 Hr.	Myasthenic Reaction
				Cholesterol	Calcium	Phosphorus	Sugar		
B. H.	♀	60	−25%	138	11	4.0	80	70 mg.	Positive
F. Z.	♀	39	+ 9%	170	9.9	4.8	93	230 mg.	Positive
A. T.	♀	48	+ 6%	165	12	4.4	78	71 mg.	Negative

asthenia in cases 1 and 2 was considered to bear some relationship to a disturbance of muscle metabolism analogous to that seen in myasthenia gravis. This new view suggested the use of prostigmine and aminoacetic acid. Prostigmine alone had less beneficial effect in overcoming the asthenia than when it was combined with aminoacetic acid. During the studies on adiposis dolorosa we observed that aminoacetic acid was of decided benefit in four patients with obesity in whom a reduction in caloric intake produced extreme weakness. The inclusion of aminoacetic acid in their food enabled the patients to continue with a subcaloric diet and to lose weight satisfactorily. Investigation of this problem is in progress.[11]

SUMMARY

In three patients presenting the syndrome of adiposis dolorosa, asthenia was a prominent feature. Two cases presented signs of myasthenia gravis (myasthenic reaction and creatinuria). In these two cases the administration of aminoacetic acid and prostigmine resulted in marked improvement. The third case showed symptoms suggestive of associated muscular dystrophy. Aminoacetic acid improved her general condition; however, the muscles of the back (muscular dystrophy) responded less favorably.

1727 Pine Street.

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DRAINAGE OF CEREBROSPINAL FLUID

IN TREATMENT OF HYDROCEPHALUS, SYRINGOMYELIA AND SYRINGOBULBIA

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The physiologic result of cutting the sympathetic nerves is to dilate the arterioles and venules. This necessarily increases the rate of capillary flow and thus relieves edema.

It has been shown by Forbes and Wolff [1] that the cerebral blood vessels are under the control of the sympathetic nervous system, and I have shown that the brain on the side on which the stellate ganglion has been removed is pink in contrast to the bluish color of the contralateral side; that the anastomosing vessels appear less numerous and that the brain gradually shrinks away from the parietes on the ipsilateral side. These phenomena are displayed when the brain has been exposed.[2]

The shrinkage of the brain on the ipsilateral side suggested to me that the operation of superior thoracic ganglionectomy might be used in the treatment of hydrocephalus. I treated two patients in this manner. The following is a short account of each case:

CASE 1.—A boy, aged 14 years, had a normal birth. Three weeks after birth he had convulsions and was subject to fits for ten years. There had been no fits for four years prior

Fig. 1 (case 2).—Patient two years before operation, showing symmetrical head.

to his coming under observation. The fits used to last from four to five hours. Enlargement of the head was first noticed one month after the first convulsion, and it continued to enlarge until the time of operation, when it measured 61 cm. in circumference. The patient had never walked; he had contractures of the hamstrings and plantar flexing muscles of each lower limb. On account of paresis of the quadriceps, the knee jerks were unobtainable, but there was an ankle jerk increased in excitability and slower than normal in relaxation. The patient was mentally defective, though not to a severe degree. He had never been educated.

The operation of superior thoracic ganglionectomy was performed on each side in May 1931. Since the operative treatment his head has ceased to enlarge and on June 29, 1932, measured 61 cm. in minimum circumference. There has been some improvement in intelligence. After this date I lost sight of the patient.

CASE 2.—A youth, 18, had a normal birth. His head was so enlarged at 3 months of age that his bonnets had to be made to measure. When first seen in June 1926 he had

1. Forbes, H. S.: Cerebral Circulation, Observation and Measurement of Pial Vessels, Arch. Neurol. & Psychiat. **19:** 751 (May) 1928. Forbes, H. S., and Wolff, H. G.: Cerebral Circulation: Vasomotor Control of Cerebral Vessels, ibid. **19:** 1057 (June) 1928.
2. Royle, N. D.: Alteration of Circulation of the Brain by Surgical Means in Diseases of the Central Nervous System, Brit. M. J. **1:** 1063 (June 11) 1932.

spastic paraplegia, for which condition I performed a lumbar sympathetic ramisection on each side. This enabled the patient to gain his balance and improve his walking. He was able to run after the operation, whereas he was not able to do this prior to the operation. When examined in April 1932, the knee jerks still exhibited phasic response of considerable range and were retarded in relaxation, and the oscillations were absent. The right side showed these phenomena more defi-

Fig. 2 (case 2).—Flattening of head on left side eighteen months after operation. Note paler color of left ear.

nitely than the left. The Babinski reaction was positive on both sides. The patient walked well but dragged his right foot. His head measured 67.7 cm. in circumference and, according to his parents, was increasing in size. He was slightly mentally defective and had the intelligence of a boy of 14. His memory was defective; he could not remember recent events. The patient had had constipation before the first operation but this had been relieved. Before the present operation he had frequency of micturition during excitement, as when watching a football match and also in cold weather.

Changes in Measurement of Head

	Anteroposterior Diameter, Cm.	Lateral Diameter, Cm.	Circumference, Cm.
May 2, 1932.....	22.75	18.75	67.6
June 13	22.4	18.6	66.8
October 22	22.5	18.3	66.8
March 29, 1933.....	22.5	18.5	66.7
July 15, 1934	22.6	18.6	67
Sept. 9, 1936.....	22.4	18.8	67.3

The operation of the left superior thoracic ganglionectomy was performed on the patient, April 30, 1932. The frequency of micturition became normal. His head began to shrink immediately, so that in six months it measured 67 cm. Measurements taken with calipers and steel tape showed the changes in size given in the accompanying table.

This is, I believe, the first instance in which an operation for hydrocephalus has been followed by definite decrease in size of the head. This result is probably due to the relief of edema of the soft tissues of the scalp (figs. 2 and 3).

The application of sympathetic surgery to syringomyelia was not intentional.

CASE 3.—A girl, aged 17 years, suffered from aching feet, clawed hands and vasomotor changes in both upper and lower limbs, which were usually purple. In winter she suffered from chilblains. The pupils were small but not pinpoint. Her knee jerks were exaggerated in phasic response and there was a prolonged postural response. She had a wrist jerk of similar type. She had loss of balance in both lower limbs and had a spastic gait. There were sensory changes in both upper and lower limbs, particularly with regard to perception of heat and cold. Her condition was diagnosed by Dr. A. W. Holmes à Court, honorary physician at Sydney Hospital, as syringomyelia. Lumbar sympathetic ramisection on the right side was performed April 29, 1930, on account of loss of balance and spasticity in the lower limbs and gave surprising results. Not only did the spastic gait cease to affect the patient in both lower limbs but the clawing of the hands gradually diminished and the purple color of the limbs disappeared also. When examined two years later her condition was normal excepting that perception of heat and cold was still inaccurate but improved.

I did not appreciate this result until I saw a patient suffering from syringobulbia. I then realized that drainage of the cerebrospinal fluid had been effected:

CASE 4.—Three years ago the patient was thrown from a horse and fell on the right side of his neck. Headache developed six weeks later and continued up to the time of operation. The pain was referred to the front of the right ear and radiated down the shoulder in the region supplied by the cervical plexus. The right hand and arm had been numbed and clumsy for three years. The right arm also felt heavy, and he had noticed twitching in it for some time. He had also noticed that the fingers of the right hand appeared shorter than those of the left hand. On looking to the right he had double vision.

On examination the patient had ptosis of the right eyelid and nystagmus of both eyes to the left. The pupils were small but reacted to light and in accommodation. He had paralysis of the right half of the soft palate. He had loss of power in the right arm and shoulder. He had loss of sensation in the right half of the face and loss of heat and cold sensibility and pain in the area supplied by the

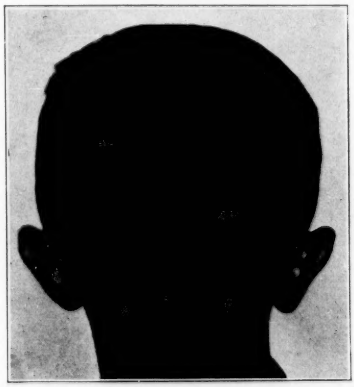

Fig. 3 (case 2).—Back view showing flattening of head on left side. Note paler color of left ear.

cervical plexus. The knee jerk gave an active phasic response with absence of oscillations on the right side and normal oscillations on the left side. The patient fell to the left when walking and could not balance on his right lower limb. His tongue was paralyzed on the right side (fig. 4*A*) and there were fine fibrillary twitchings on this side. When protruded it turned to the right.

Dr. J. D. Herlihy, honorary physician at Lewisham Hospital, diagnosed his condition as syringobulbia.

The operation of superior thoracic ganglionectomy was carried out March 20, 1936, with the following results:

Within a few days the pain on the right side of the face became very much less. Nystagmus gradually disappeared and is now almost gone. The tongue was gradually restored

Fig. 4 (case 4).—*A*, paralysis of right half of tongue before operation; *B*, recovery of right half of tongue six months after operation.

to normal condition. It can now be protruded normally (fig. 4 *B*), and the fibrillary twitchings are less evident. The soft palate has recovered. He has lost the staggering gate and stands well on either lower limb. He can now see farther to the right than he could before the operation.

COMMENTS ON THESE CASES

The operation of superior thoracic ganglionectomy causes an increase in the rate of capillary flow in the

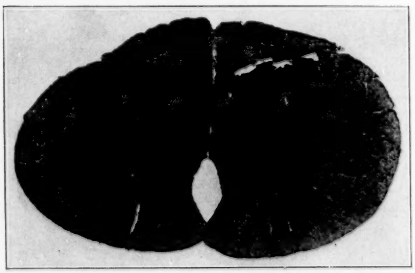

Fig. 5.—Greater drainage on the ipsilateral side after a left lumbar sympathectomy. The animal was electrocuted after being lightly anesthetized. Specimen obtained six weeks after operation.

cervical region of the spinal cord and of the brain. The operation of lumbar sympathectomy increases the rate of drainage on the ipsilateral side of the cord in the lumbar region, as shown in figure 5. Both operations provide an outlet for the cerebrospinal fluid where they tap the spinal circulation. It is just as if a drain were placed in either position. In contrast to the other methods of draining the cord, this method has the virtue of permanence.

There has been a bogy raised recently in the shape of the effect of epinephrine on sympathetically denervated structures. It is said that the denervated structures are more sensitive to epinephrine. If this is so, why does Horner's syndrome persist in patients who underwent operation eight or ten years ago, or why have the effects described in this paper persisted in one case for seven years and in another for five years?

In my opinion, epinephrine has no more effect or not as much effect on denervated sympathetic structures as it has on normal structures, and this is shown by operative results in hundreds of patients.

In my experiments on the effect of epinephrine and ephedrine on muscle tone, the sympathectomized limb was the only one that did not show an increased tone under the influence of large doses of epinephrine.[3] This shows that epinephrine did not affect the spinal blood vessels.

CONCLUSIONS

1. Superior thoracic ganglionectomy is effective in causing increased drainage of cerebrospinal fluid in chronic hydrocephalus and syringobulbia.
2. Lumbar sympathectomy is an effective treatment for syringomyelia.
3. Epinephrine has little effect after sympathetic denervation.

185 Macquarie Street.

Clinical Notes, Suggestions and New Instruments

UNUSUAL FRACTURE DISLOCATIONS OF CERVICAL SPINE

HERMAN B. PHILIPS, M.D., NEW YORK

This case history shows how severe an injury to the upper part of the cervical spine may be without any permanent disability. Several very unusual features in this case make it worthy of presentation.

During May 1936, while working as a stevedore, the patient was struck on the back of the neck by a falling log, weighing 700 pounds, and knocked from the dock on which he was working to an adjacent lighter. He lost consciousness for several hours and was taken to a hospital, where he remained in bed for about a month and then was permitted up and about until he was discharged from the hospital about a week later. He sustained lacerations of the scalp and an injury to the upper part of the neck and stated that x-ray examination showed a fracture of one of the vertebrae. According to his story there was no vomiting or double vision at any time. One lumbar puncture was performed, but the results were unknown to him. For a day or two after the injury the patient cleared blood from his nose but did not bleed from his ears. He complained of deafness in the right ear about a month after the injury. About the middle of June and early in July he experienced a sudden transient complete loss of vision in the right eye. The pain in the back of his neck and head showed gradual improvement. The pain was increased by turning the head to the left and also increased by lying on one side for a prolonged period. The rest of the history is irrelevant, as far as this injury is concerned.

EXAMINATION

The physical examination, except for the neurologic examination, was irrelevant. The neurologic examination, by a competent neurologist, showed the following:

Cranial Nerves.—1. The sense of smell was normal.

2. The fundi and visual fields were normal. Acuity was not tested.

3. Royle, N. D.: The Increase in Muscle Tone Following Stimulation of the Sympathetic Nervous System, M. J. Australia **1**:740 (June 1) 1929.

3, 4 and 6. Both pupils were slightly irregular but reacted normally. The eye movements were normal.

5. Corneal and nostril reflexes were equal and active. The motor component was normal. The patient claimed decreased sensibility in the right cheek and temple, but the responses to touch and pain stimuli were inconsistent and the normal corneal and nostril reflexes were incompatible with an organic sensory loss.

7. There was no facial weakness.

8. Sound was lateralized to the right and there was impaired bone and ear conduction in the right ear. Semicircular canal function could not be tested by rapid head movement because of the stiffness of the neck muscles.

9 to 12. The palate and tongue movements were normal.

Other Tests.—Examination of the motor system showed no swaying on the Romberg test. There was no tremor, weakness or ataxia. The sensory system was normal. The tendon and superficial reflexes were normal and equal on the two sides. The mental status was normal.

The Head.—There are recently healed scars of scalp lacerations. One about 2½ inches long is in the right upper midparietal region and is nonadherent and nontender. The other scar, about 2 inches long, is to the left of the midline just about the bregma, and there is a slight depression along the line of the scar which is cleanly healed and nontender. There is no other skull abnormality. The patient holds his head rather stiff most of the time, and the right lateral and posterior cervical muscles are tense and tender to pressure.

Opinion based on the history and physical manifestations is that there are (1) lacerations of the scalp, injury to the neck and a moderately severe cerebral concussion; (2) no signs of intracranial or spinal cord injury at the present time and no postconcussional symptoms, and (3) pain in the area supplied by the second and third cervical nerves on both sides due to injury affecting the muscles and ligaments of the neck and would be a normal consequence of any accompanying fracture.

ROENTGEN EXAMINATION

There are multiple fractures of the atlas and axis with dislocations of the articulations between the atlas and the skull and the atlas and the axis.

The posterior arch of the atlas has sustained two complete transverse fractures which are not united. They are clearly seen in the lateral and vertex-occipital roentgenograms (figs. 2 *B* and 1 *A*). On the right side the fragments are separated by about one-fourth inch and on the left side by about one-eighth inch. The fracture on the right side is comminuted, with a small intermediate fragment. The extreme posterior portion of the posterior arch, which is about 2 inches in length, is displaced posteriorly and to the left side. There are no evidences whatever of any attempt at bony union, this posterior portion of the arch being unattached by bone structures to any of the adjoining portions of the spine.

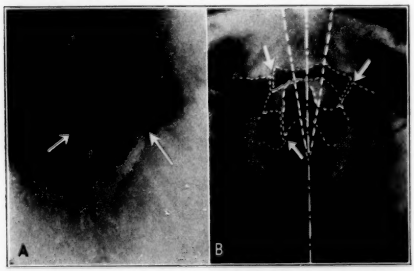

Fig. 1.—*A*, vertex-occipital view, showing posterior portions of neural arches of upper cervical segments projected through the foramen magnum. Asymmetry and deformity are apparent. *B*, submento-occipital view, showing anterior portions of neural arches of upper cervical segments with fractures and deformities. Roentgenogram retouched.

There are multiple fractures of the anterior arch of the atlas. At least two complete fractures are present, one on the right side and one on the left side of the tubercle. These fractures are united, with considerable deformity and irregularities in contour of the bone. Spur formations are produced on the anterior margins of the arch and the tubercle is displaced to the left of the midline by one-fourth inch and to the left of the midplane of the odontoid process by one-half inch (fig. 1 *B*). All of them should be in the same plane. The entire atlas is spread out peripherally, the anterior arch being displaced anteriorly, the lateral portions of the atlas, which include articular and transverse processes, are displaced laterally, and the posterior arch is displaced dorsally and to the left.

The space between the anterior surface of the body of the axis and the posterior surface of the anterior arch of the atlas is twice the normal width (fig. 1 *B*). This is due to the spread of the anterior portion of the arch of the atlas as well as to anterior displacement of the atlas with respect to the axis. This anterior displacement is asymmetrical, owing to rotation anteriorly to the left side of the atlas.

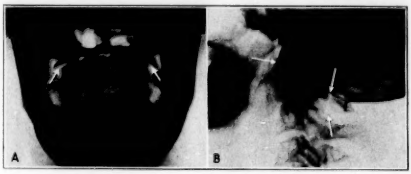

Fig. 2.—*A*, anteroposterior view of upper cervical spine through open mouth. Shows asymmetry of atlanto-axial articulations. *B*, lateral view of upper cervical segments, showing fractures of posterior portions of neural arch of atlas and of styloid process of temporal bone.

There is a longitudinal fracture of the anterolateral portion of the body of the axis adjoining the base of the odontoid process on the right side. The fracture is seen in all of the mento-occipital exposures (fig. 1 *B*). The fracture appears united, but there is an associated irregularity in contour of the base of the odontoid process, as a result of the fracture. There is also some irregular density extending completely across the body, apparently along the united fracture line. As a result of this fracture the odontoid process is angulated slightly to the right side at an angle of approximately 10 degrees.

The separation of the fragments of the atlas has resulted in partial dislocations of the articulations between the skull, the axis and the atlas. Both the lower articular surfaces of the atlas are displaced outward one-fourth inch with respect to the corresponding articulations of the axis and the skull (fig. 2 *A*). The anterior rotational displacement of the left lateral portion of the atlas contributes to an additional dislocation, so that the articular surface on the left side between the atlas and the axis is almost completely obliterated in the anteroposterior roentgenogram. The occipital condyle (the articular process of the base of the skull) is clearly defined on the right side, as is also the articulation between it and the articular process of the atlas, but on the left side there is a definite overlapping of shadows, showing a subluxation of this articulation. Apparently in addition to there being a bilateral outward displacement of the articular process of the atlas there is also an anterior displacement on the left side, which produces an additional subluxation with respect to the atlas below and the occipital condyle skull) above (fig. 2 *A*).

There is, in addition, an incompletely united fracture of the styloid process of the left temporal bone (fig. 2 *B*).

COMMENT

The injuries sustained in this case are usually associated with compression or lacerations of the spinal cord or hemorrhage into or near the brain stem or base of the brain and are usually fatal, but in this instance, in spite of an unusually severe combination of fractures and subluxations, there was a coincidental decompression by peripheral displacement of fragments and their subsequent nonunion, which contributed in no small degree to the patient's recovery.

The peripheral displacement of the fragments of the atlas and their nonunion subsequently were as effective as an actual

decompression operation, and this undoubtedly saved the patient's life. The case illustrates, notwithstanding prevalent notions to the contrary, that extensive severe injuries in close proximity to vital structures are compatible with fairly complete recovery and reasonably good health. The case also indicates the necessity for thorough roentgenographic study. More than forty roentgenograms were made during several examinations over several weeks, until completely satisfactory exposures were secured. When first seen soon after a severe injury, thorough examinations should not be undertaken, for positioning the patient for demonstrating fractures and dislocations of the uppermost segments of the spine, such as in this case, would undoubtedly jeopardize the life of the patient. As the patient recovers and a safe period is reached, more thorough roentgenographic studies can be made with impunity.

9 West Sixty-Eighth Street.

POSTMORTEM VERIFICATION OF ANTERIOR POLIOMYELITIS IN A MAN OF ADVANCED YEARS

MAX J. FOX, M.D., MILWAUKEE
Assistant Superintendent, City of Milwaukee Isolation Hospital

During the months of July, August, September and October 1937 the city of Milwaukee had a mild epidemic of poliomyelitis. During this time 110 patients were interned at the city isolation hospital for medical services.

Among these patients was one in particular whose case seemed worthy of adding to the medical literature because of the advanced age of the patient.

Correspondence with superintendents of contagious disease hospitals in the United States failed to bring to light any patient with poliomyelitis approaching the age of this one. Dr. Josephine B. Neal states that in 1914 she had a patient aged 55, in 1916 a patient aged 58 and in 1921 a patient aged 50. Lavinder, Freeman and Frost [1] found seven patients between the ages of 45 and 64 in the epidemic of 1916 in New York City. Forsbeck and Luther [2] reported on the mass epidemic of 1908 to 1929 in which there were four instances between the ages of 55 and 59. My patient seems to be the oldest on record to date as having died of poliomyelitis.

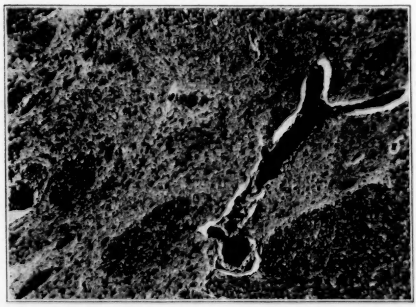

Fig. 1.—Section from the dilated blood vessels of the pons filled with stagnant blood. Around the vessels there is a collar of lymphocytic infiltration. Somewhat distant from the vessels there is some perivascular edema.

REPORT OF CASE

E. H., a man, aged 68, a painter, entered the hospital with almost total paralysis of both legs. Four days prior to this an infection of the upper respiratory tract, a cough and general malaise had developed. Two days later he began having pain in the lower part of the back and the thighs. This was followed by a gradually increasing weakness in the lower extremities and by evening he was unable to walk. The next morning he was able to move only his toes. The following day he was brought to the hospital.

The patient's family and past personal history were negative except for an injury to the lower part of the back sustained thirty-three years before and a back strain received while he was lifting a heavy object about one week before his entrance to the hospital.

Fig. 2.—Microscopic study under low power of section from cervical cord showing a blood vessel which is filled with erythrocytes. There is also perivascular lymphocytic infiltration. The tissue outside the vessels appears edematous and contains lymphocytes scattered throughout.

On physical examination at the time of entrance to the hospital the patient, a slender man, was partially paralyzed but apparently not acutely ill. Physical and neurologic examinations of the head were negative except for a coryza and a mild pharyngitis. There was no rigidity of the neck or adenopathy. Examination of the chest was negative except for a few scattered fine rales in the bases of both lungs. The heart was normal with a blood pressure of 130 systolic, 80 diastolic. Examination of the upper extremities revealed a slight tremor and a slight amount of muscular incoordination. The reflexes of both biceps and triceps were slightly exaggerated. No muscular weakness was evident. The Kernig and Brudzinski signs were both absent. Both lower extremities were flaccid except for weak flexion and extension of the toes, weak dorsiflexion of the left foot and weak adduction of the right thigh. There was a slight amount of tenderness over the calf muscles on pressure, but no other sensory disturbance was present. The patellar and achilles reflexes were absent. There was no ankle clonus, and Babinski's sign was absent. There was an absence of the abdominal and cremasteric reflexes.

A lumbar puncture was done and 5 cc. of clear fluid withdrawn under normal pressure. The Queckenstedt test was positive. The spinal fluid cell count was 205 cells per cubic millimeter, predominantly lymphocytes. Urinalysis was negative. The blood count was essentially normal except for a moderate leukocytosis of 8,250 white blood cells per cubic millimeter with a differential count of 64 per cent polymorphonuclears, 25 per cent lymphocytes and 11 per cent monocytes.

A diagnosis of poliomyelitis was made.

On the following morning another lumbar puncture was done and three-eighths grain (0.024 Gm.) of ephedrine sulfate to 2 cc. of physiologic solution of sodium chloride was injected intrathecally. Examination of the spinal fluid showed no increase in globulin; chlorides were 718 mg. per hundred cubic centimeters; the Ross-Jones and Noguchi tests were negative, as were the Wassermann and Kahn tests. The colloidal gold curve was 0000000000. A cell count of the spinal fluid at this time was 106 cells per cubic millimeter, 100 per cent lymphocytes.

1. Lavinder, C. H.; Freeman, A. W., and Frost, W. H.: Poliomyelitis: Report of the International Committee, Baltimore, Williams & Wilkins, 1932, p. 388.
2. Forsbeck and Luther: Poliomyelitis: Report of the International Committee, Baltimore, Williams & Wilkins, 1916, p. 411.

During the next twenty-four hours, except for considerable coughing and the presence of large moist rales over the bronchi, the patient's condition was unchanged. There was no increase in the amount of paralysis. A beginning pneumonia was suspected at this time.

On the following morning the patient became quite cyanotic; respirations were rapid and labored, and the pulse was rapid but of good quality. The temperature rose to 103.2 F. There was percussion dulness over both lung bases. Diminution of breath sounds and many moist rales were present, confirming the diagnosis of pneumonia. Respiratory stimulants and nasal oxygen were given, to which the patient responded weakly. The next morning, ten days after the onset of his illness, the patient failed suddenly and was found dead. An autopsy was performed by Drs. J. C. Grill and L. J. Van Hecke of the pathologic department of Marquette University.

SUMMARY OF MACROSCOPIC AND MICROSCOPIC EXAMINATIONS

The body was of a well developed and well nourished man.

The pupils were unequal, the left measuring 3.5 mm. and the right 5 mm. in diameter.

There was moderate abdominal distention.

The lungs were voluminous. The pleural cavities were normal. In both the right and the left lung were scattered foci of aspiration, apparently bronchopneumonia, with small areas of necrosis in the lower portion of the left upper lobe. The bronchi contained a thick, purulent material. The mucous membranes were thickened and injected.

The heart showed no macroscopic changes. The arch and descending aorta presented a moderate atheromatosis.

The liver had a moderate cloudy swelling with a loss of normal markings.

The spleen was slightly enlarged with a soft, grayish red parenchyma.

The kidneys were moderately swollen. The urinary bladder was considerably distended with a clear, yellow urine. The prostate was enlarged and had small adenomas in the lateral lobes.

Aside from distention, the gastro-intestinal tract was without marked change.

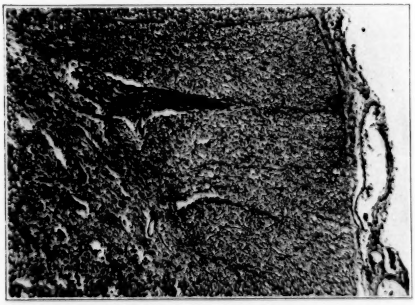

Fig. 3.—Low power section from the lumbar cord. In the periphery of the section one notices an infiltration of the leptomeninges with lymphocytes and a few polymorphonuclear leukocytes. The remaining section presents a similar microscopic picture as in figure 2; viz., stagnant blood in the vessels, perivascular infiltration, lymphocytic infiltration of the remaining tissue with some proliferation of microglia.

There was hypertrophic lipping of the edges of the vertebral bodies of the spine which was most marked in the lumbar region.

The skull showed no pathologic change. The leptomeninges of the brain were congested. The cortex of the brain was of a violet color, giving a sharp contrast to the white matter; otherwise there were no obvious macroscopic changes. The spinal cord revealed congestion of the leptomeninges but nothing further was obvious.

On microscopic examination all sections revealed an increased number of leukocytes within the blood vessels.

Microscopically the heart was normal.

The lungs had a purulent bronchitis and bronchopneumonia with marked necrosis in some portions.

The liver had a finely granular liver cell cytoplasm. There were no nuclear changes, and while the sinusoids contained

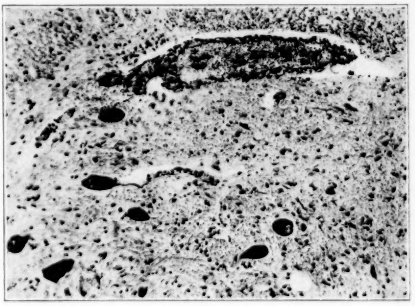

Fig. 4.—Section of lumbar cord under high power. There is marked degeneration of the ganglion cells. The surrounding tissue presents a lymphocytic infiltration and proliferation of microglia. The blood vessels are filled with stagnant blood and present perivascular infiltration and edema.

numerous leukocytes there was only a moderate swelling of the tubular epithelium and a very occasional lymphocytic infiltrated scar. The glomeruli were normal.

The prostate evidenced a fibromuscular hypertrophy.

The spleen suggested the appearance of a reticulum hyperplasia and some of the monocytes had phagocyted red blood cells. The malpighian bodies were moderately hyperplastic.

The adrenal gland and pituitary gland showed no obvious changes.

Microscopic sections of the central nervous system demonstrated many changes. All sections of the cord revealed degeneration of the anterior horn. In some of these degenerated areas were extravascular red blood cells, especially in the most degenerated portions. This degeneration was either on both sides or on one side. The degeneration was evidenced by various alterations of the nerve cells, which ranged from simple swelling with slight eccentricity of the nucleus to complete loss of pigment, nucleus and nucleolus. The principle cell of exudate appeared to be a mononuclear cell with a nucleus of horseshoe shape, the cystoplasm of which for the most part was foamy. There was a scattering of polymorphonuclear leukocytes and a few small round cells. The small round cells, however, were in superabundance in the perivascular spaces not only in the anterior regions but in all other portions of the cord as well, and even in some parts of the leptomeninges. In one section of the thoracic cord degeneration seemed to have extended out into the lateral fasciculus, and elsewhere it remained practically confined to the region of the anterior horn. There were no obvious changes in the cells of the column of Clarke. On section of the posterior sensory ganglion an apparently normal structure was found; however, one or two cells in each section had undergone obvious degenerative changes. In these sections, however, there was no perivascular round cell infiltration.

In sections higher up on the cord there was a continuation of the same process, and in the medulla at the olivary nucleus there was definite perivascular round cell infiltration but relatively little obvious degenerative change. Sections from the lower pons had a similar appearance with very early nerve cell infiltration but no obvious nerve cell degeneration. The ventricular ependyma and the basal nuclei showed no obvious alterations. There were no alterations either of structure or of the blood vessels in the cerebral cortex and cerebellum. The leptomeninges in the sections of cord had somewhat

increased numbers of small round cells in the arachnoid spaces and a slight perivascular round cell infiltration. There were lymphocytes in the leptomeninges of the brain but no typical collars around the blood vessels.

The microscopic diagnosis was (1) acute anterior poliomyelitis, (2) purulent bronchitis, (3) aspiration pneumonia with beginning gangrene of the lung, (4) parenchymatous degeneration of the liver and kidney, (5) mononuclear erythrophagocytosis of the spleen and (6) lymphocytic infiltration of the leptomeninges.

COMMENT

In this case the clinical picture, the laboratory studies and the postmortem examination conform to the pathologic changes expected in anterior poliomyelitis. There was nothing revealed to evidence any other clinical entity.

CONCLUSION

This disease should be known as anterior poliomyelitis.

It occurs with greatest frequency in the young, occasionally in older persons. The present patient appears to be the oldest person on record as having died of this disease.

BACILLUS VIOLACEUS INFECTION IN A HUMAN BEING

M. E. BLACK, M.D., AND JOHN SHAHAN, M.D., CLEARWATER, FLA.

Bacillus violaceus is ordinarily considered nonpathogenic. Woolley,[1] however, described several fatal cases in animals due to a strain of this chromogen, but so far as we have been able to ascertain no cases of infection of human beings with this organism have been described. We therefore present the following case:

REPORT OF CASE

History.—S. P., a white boy, aged 6 years, admitted to the Morton F. Plant Hospital on the afternoon of Aug. 17, 1937, had been ill for three days. He had been a normal child in all physical respects and had had but one illness before this time. Some months previously he had suffered from an acute inguinal adenitis, which caused elevation of temperature and

Fig. 1.—Appearance of left arm Aug. 30, 1937.

chills for a few days and then subsided. This was thought to be due to an infection of the lower extremity of the affected side.

Two or three days prior to the onset of the present illness he, with a number of children, had been wading in a pool of rain water which had collected in a low spot of ground. At the onset of illness he had an elevation of temperature and complained of pain in the right inguinal region. There was some tendency to nausea and vomiting, but there were no other subjective symptoms of note.

Read before the Pinellas County (Fla.) Medical Society, Dec. 3, 1937.

1. Woolley, P. G.: Bacillus Violaceus Manillae, Bull. Johns Hopkins Hosp., March 1905.

Examination.—The patient was well nourished and appeared to be seriously ill; he was irrational. A profuse perspiration was present, despite a temperature of 101 F. Inspection revealed from eight to ten skin lesions appearing on the flexor surface of the left arm just above the elbow, on the lateral surface of the right elbow and on the right side of the trunk; the latter ones were distributed over the ventral and dorsal surfaces. There were also several of the lesions low down on the right anterior abdominal wall. The glands in the right inguinal region were quite swollen and tender. The left arm exhibited a marked cellulitis and lymphangitis with tender and swollen glands in the left axilla. It appeared that these would

Fig. 2.—Appearance of right arm Aug. 30, 1937.

suppurate in a short time. The appearance of the cutaneous lesions was distinctive and at first looked like those of anthrax. However, a difference was to be noted. These varied in size from one-half by 1 inch to one or two that were twice that size. In each there was a dark mahogany red eschar, slightly depressed and dry. Each of these was surrounded by a pustular area, which showed a distinct violet color in the surface of the pustular ring. The pus was semithick and yellowish white. It was nonodorous and not very profuse.

Except for these cutaneous lesions, the physical examination gave negative results.

Smears from the lesions showed a slender gram-negative bacillus about the size of B. typhosus, arranged singly, in pairs and in groups, and repeated agar cultures of material taken from each of the lesions produced discrete deep violet colonies, the color remaining on or very near the surface and not diffused throughout the medium. The pigment was slightly soluble in water and quite soluble in alcohol. The growth emulsified with difficulty. Microscopically, from cultures, the organism showed vacuoles resembling spores, but these clear areas did not take the spore stains. The organism was killed completely at boiling temperatures. No gas was produced in the ordinary sugar mediums, and only in glucose was there acid formation. On blood agar plates clear hemolytic zones surrounded the colonies. On the tenth day of the disease the patient's serum agglutinated the organism completely in a titer of 1:640 in thirty minutes, and in a titer of 1:1,280 in two hours, with no agglutination in the negative controls. Cultures taken on blood, stool and urine were negative. Results of agglutination tests for Malta fever, tularemia and typhoid were negative, as was also that of the Kahn test. There were no molds, yeasts, or any other organisms found in the lesions at any time.

Subcutaneous injection of 0.1 cc. of a bouillon subculture of the organism into a rabbit produced in twenty-four hours a temperature of 103.6 F. and at the site of inoculation a dark red edematous lesion about 1½ inches in diameter, which on the next day was surrounded by a wide, dark blue zone. The animal died in forty-eight hours, and from the original lesion, as well as from the liver, lungs, spleen, kidneys and heart's blood, B. violaceus was recovered in pure and abundant culture.

September 8, x-ray examination showed the chest, heart, lungs and bony framework to be normal. The urine was normal throughout the entire illness.

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August 17, erythrocytes numbered 4,032,000; leukocytes 25,000, with 88 per cent neutrophils, hemoglobin 90 per cent.

August 26 the erythrocytes numbered 2,832,000, leukocytes 10,600, hemoglobin 55 per cent. September 1, erythrocytes numbered 2,310,000; hemoglobin 50 per cent. September 8, erythrocytes numbered 2,700,000, leukocytes 10,800, neutrophils 80, hemoglobin 48 per cent.

Treatment.—In the beginning, it should be noted that the patient had been under treatment for four days before he was seen by us. During this time he had been given 80 grains (5 Gm.) of sulfanilamide daily. He had experienced marked gastric and mental upset by the time of his admission to the hospital. It was thought at first that the appearance of the lesions might be due to a chemical change brought about by some local treatment, but such was not the case.

chart shows only two point observations for each twenty-four hour period. All readings were rectal. Within the first week of illness a great deal of abdominal distention occurred, and vomiting was frequent for several days. Simultaneously, large liquid stools appeared which were not of noxious odor and were jet black. Repeated tests for blood gave negative results, and the black stools were never satisfactorily explained. The patient lost weight rapidly and it became evident that his only hope for recovery lay in building up an immunity in the blood stream before he became exhausted physically. The transfusions made a great deal of difference in his appearance and in the clinical course in a short time.

Approximately two weeks after the last temperature chart was made he was having a very slight rise in temperature each day but was feeling well and was allowed to be up. He was

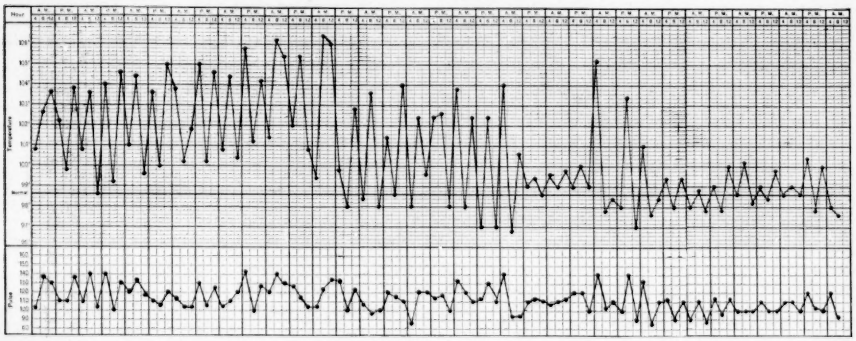

Fig. 3.—Temperature and pulse.

Cultures of material from the local lesions and of the blood were taken. The lesions were thought to be of a mixed type infection due to the pustular ring and the marked cellulitis exhibited on the left arm. Temporarily, ointment of ammoniated mercury (U. S. P.) was applied under a gauze dressing over each lesion. After three days a culture was taken from the midst of the ointment covering one of the lesions and the same bacillus was found in pure culture. The lesions were spreading radially from day to day, always accompanied by the peculiar violet color in the skin. At this time it was decided to use wet dressings, and a solution of 1:2,000 merthiolate was used for several days. The lesions still showed no sign of healing, and the culture was still positive for the one organism. Because of some of its cultural characteristics and its pigment formation, it was thought that perhaps a wet dressing of an acid solution would be more efficacious. Accordingly, 7 per cent acetic acid was used for a time, with the same result.

At about this time the child's condition appeared desperate, and, since the lesions had shown no tendency to stop spreading and new ones were appearing constantly, it was decided to cleanse all of them and cauterize them with 10 per cent silver nitrate solution. This act caused a great deal of pain but accomplished nothing else. Subsequently freshly prepared dilute solution of sodium hypochlorite was used for a long time. It might be stated that nothing that was used as a local application appeared to inhibit the growth of the organisms or to stop the spreading lesions. Cultures remained positive until they were all healed.

One transfusion of citrated blood (100 cc.) was given September 3. This was followed by marked improvement within two days. A second transfusion (250 cc.) of citrated blood was given September 11, with a subsequent marked improvement.

Clinical Course.—As will be seen in the accompanying chart of temperature and pulse (fig. 3), the patient was very ill during most of the course of the disease. The temperature

barely able to stand and walk a few steps and appeared greatly emaciated. The last skin lesion had healed by Oct. 26, 1937. The violet pigmentation persisted in the scars of the healed lesions.

Coachman Building.

THE AMOUNT OF ANTITOXIN USED IN A CASE OF TETANUS

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The case reported here is submitted principally because of the amount of antitoxin used but also for some peculiar features of the disease. The report of the case was prepared by Dr. W. H. West, the medical intern, and presented to the staff meeting of St. Mary's Hospital. His report is as follows:

A man, aged 42, American of German descent, a salesman for a plumbing supply company, admitted to the hospital July 2, 1937, complained chiefly of spasms of the muscles of the neck and abdomen. June 28 he was treated by a dentist for alveolar abscess. The patient was unaware of this abscess until the dentist, on examination of the teeth a few months previously, had diagnosed its presence. At no time had it caused any discomfort. The dentist opened the gums in the upper right side and packed them with surgical dressing (dental). The following day the patient had a mild fever and several chills. These were thought to be due to the alveolar abscess. Four days after the dental surgery was performed the patient noticed an increasing tenseness of the muscles of the neck. June 30 he had two acute spasms, tonic in nature, drawing the head posteriorly and lasting from three to four minutes. Their onset was caused by any quick movement. The spasms were not painful. There was inability to open the mouth as normally. The day previous to admission to the hospital he had six such spasms associated with spasms of the upper abdominal muscles.

The patient recalled picking blackberries about June 20, at which time he repaired a flat tire on a dusty road; he had some superficial scratches on his hands at this time.

There were no important points in the past history except that twelve years previously he injured the right eye, the vision of which was lost.

On physical examination July 2, the patient was well developed and had a bronze complexion; he weighed 185 pounds (84 Kg.). The palpebral fissures were wide, showing the sclera of the eyes; there was a peculiar smiling appearance, with the teeth visible. The patient was rational, cooperative and in no evident pain. The right pupil was small and there was no response to direct light (traumatic cataract). The left pupil was small, with no response to direct light. The facial muscles and the muscles of mastication were found to be slightly rigid. The gums were not tender and the teeth were in excellent condition. The sternomastoid and trapezius muscles were rigid; the head was slightly retracted, it being impossible to flex the head on the chest. There was tenderness inferior to the right mastoid region. The heart and lungs showed no abnormalities. The abdominal muscles above the umbilicus were tense. The genitalia and extremities showed no abnormalities except for a slight mark on the left palm received from a blackberry briar. This was in the outer layer of the skin and showed no signs of inflammation.

Therefore a patient with trismus, opisthotonos, risus sardonicus, rigid abdominal muscles, hyperactive tendon reflexes, abdominal and cremasteric reflexes absent, no paralysis and general hyperesthesia was our subject.

Tetanus and meningitis were thought of, but, with no history of headache combined with the peculiar spasms, meningitis seemed to be ruled out. Twenty-three hours later a spinal tap was done showing the spinal fluid to be under pressure. There was a cell count of 3 and no globulin. The blood count revealed erythrocytes 4,760,000, leukocytes 15,200, hemoglobin 85 per cent, stab cells 13 per cent, segmented cells 63 per cent, lymphocytes 9 per cent and monocytes 3 per cent.

A catheterized specimen of urine was normal and acid. There was no bowel movement for five days after entrance until an enema was given. Twelve hours after admission the patient noticed difficulty in swallowing. He was unable to void for twenty-four hours after entrance, at which time he was catheterized. Thereafter no difficulty was experienced.

The patient began receiving tetanus antitoxin on his second day in the hospital; 25,000 units was given every four hours, 15,000 of which was given intramuscularly and 10,000 units intravenously. One hour 2 cc. of 25 per cent magnesium sulfate intramuscularly and the next hour 2 grains (0.13 Gm.) of soluble phenobarbital subcutaneously were given. This treatment was continued alternating hour by hour. With each serum injection 1 cc. of epinephrine hydrochloride was given.

The first four or five days in the hospital, mild transient painful spasms of the abdominal and cervical muscles were experienced about forty-eight or fifty times in twenty-four hours. These were at times from fifteen to twenty minutes apart, lasting from a few seconds to two minutes. At the last the left leg was included in the spasm. Any unusual noise or disturbance would cause onset of spasm. However, after the spasm was over the muscles would relax, with the exception of the upper abdominal, facial and cervical muscles. Trismus, risus sardonicus and opisthotonos remained in practically the same degree as on entrance. The inability to swallow increased the second day after entrance until the patient was able to take fluids in only very small amounts without strangling. The third day after entrance this condition gradually improved.

By the seventh day under this treatment the spasms had almost left except for a very occasional one occurring when the patient awakened. Rigidity of abdominal and cervical muscles had decreased and the patient was able to open his mouth somewhat wider. He slept most of the time at this period.

It was decided to give the 25,000 units of antitetanus serum every six hours and to administer the soluble phenobarbital and magnesium sulfate as before. On the eighth day the serum was given every eight hours. This was continued until the tenth hospital day, when the patient had five spasms, similar to those experienced previously. The serum was then injected every six hours.

On the nineteenth day after the first serum was injected he had a temperature of 102.5 F. The next day a scarlatina-like rash began to develop on the cubital region of the left elbow and left gluteal region, where most of the serum had been injected. By the next day this was diffused and "itchy." The rash lasted seven days and would increase in intensity about two hours after a serum injection. The patient felt relief after the application of calamine lotion and the administration of 1 cc. of epinephrine subcutaneously.

The last spasm was noticed July 19. The hyperactive reflexes gradually decreased after the first week in the hospital, as well as the Babinski reflex, opisthotonos, risus sardonicus and the Kernig reflex.

Thirty days after serum treatment was started, urticaria, consisting of blanched wheals that were about 2 cm. in diameter, occurred. This condition lasted for two days. Epinephrine produced some effect.

Gradually the tetanus antitoxin was decreased. The soluble phenobarbital and magnesium sulfate medication was stopped on the twenty-sixth hospital day. One month after entrance the patient was permitted up in the wheel chair. The tetanus antitoxin was discontinued on the forty-second day and the patient was permitted to go home two days later. He walked out of the hospital. Apparently all rigidity of the muscles had left except a slight restriction of motion of the lower jaw on the right. The patient's weight on dismissal was 175 pounds (79.4 Kg). The urine was normal.

Chemical analysis of the blood revealed hemoglobin 80 per cent, leukocytes 6,200, eosinophils 6 per cent, stab cells 6 per cent, segmented cells 65 per cent, lymphocytes 9 per cent and monocytes 2 per cent.

Altogether, the patient received 3,460,000 units of tetanus antitoxin; 700,000 units was given intravenously and 2,760,000 units intramuscularly. This was given over a period of forty-one days. With the modern methods of preparation of tetanus antitoxin it is possible to give large amounts of it without serum sickness, which was caused with the older types of horse serum.

It is best to continue serum administration as long as any increased tonus of muscles is present, as shown by the decrease in amount of serum injection in our case and the redevelopment of spasms. This seems to disprove an older idea that tetanus antitoxin given late in the disease does no good. This case presents the problem in which the focus of infection was not found, a chronic release of the tetanus toxin into the blood stream taking place, the antitoxin being needed to neutralize it. It does not seem probable that the tetanus originated from the opening of the abscesses, because of lack of time of incubation for such an infection as we had.

No ill effects from magnesium sulfate intramuscularly were noted, although the patient received 24 cc. of 25 per cent solution intramuscularly for twenty-five consecutive days. The blood pressure fell only 20 mm. of mercury during this time.

Therefore it seems advisable to give rest and freedom from any disturbance, maintain nourishment, prolong serum treatment as long as there are any symptoms, and administer sedatives.

First National Bank Building.

Probabilities.—The smelting of iron ores probably began in southeastern Asia Minor not much later than 1500 B. C., roughly 3,400 years ago. Bronze was cast in the same general area at least as early as the beginning of the third millennium before Christ, more than 4,900 years ago. Copper was reduced from its ores, hammered and cast into tools, weapons, and ornaments for perhaps a thousand years before its alloy, bronze, came into use. Thus six thousand years from today take us back to the Stone Age, even in those areas where human culture progressed with the greatest speed.—Hooton, E. A.: Apes, Men, and Morons, New York, G. P. Putnam's Sons, 1937, page 53.

Special Articles

ROCKY MOUNTAIN SPOTTED FEVER

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(Concluded from page 1188)

The clinical picture varies considerably. On the one extreme are ambulatory patients and abortive attacks and on the other fulminating infections with an early fatal termination. Most infections fall between these two extremes and are of more typical symptomatology, with the case fatality rate varying in different foci. Extremely mild attacks without rash presumably occur, but in such cases a specific diagnosis of spotted fever cannot be otherwise than presumptive.

The usual ambulatory patient has a low fever, the rash is scanty and may be scattered or localized and the patient is not sufficiently ill to remain in bed. The duration is less than two weeks.

Abortive attacks generally have a rather sudden stormy onset with a temperature as high as 104 F. and a pulse as high as 130; but the symptoms rapidly lessen in severity and the rash is more or less fleeting. Recovery is complete in from several days to one week.

Patients with a fulminating infection die in from three to five days. They are so highly toxic that the body defenses are literally overwhelmed from the very onset. I have observed that they either have no rash or, if it appears, the spots rapidly coalesce to form large ecchymotic blotches. There is early evidence of the involvement of the central nervous system.

The following description applies to the more typical infections, which are vastly in the majority: If the infection is fatal, death usually occurs between the ninth and the fifteenth day but may be earlier or considerably later.

The incubation period is from two to five days in the more severe infections and from three to fourteen days in the milder ones. There may be a prodromal period of from two to three days or longer, characterized by loss of appetite, irritability and malaise and frequently by chilly sensations. On the other hand, the onset may be sudden and accompanied by some combination of the following symptoms: a distinct chill, marked malaise, sweating, pronounced backache, frontal and occipital headache, injection of the conjunctivae, sensitivity of the eyes to pressure, photophobia, pain in the upper part of the abdomen, pains in the bones and muscles or both (rarely absent), nosebleed, nausea and vomiting. The eyes may appear dull. Delirium, aphasia and lack of coordination of movements are less common. The severity of the symptoms increases more or less rapidly, depending on the virulence of the infecting strain. Chilling may continue. The face soon assumes a typical dusky flush, and an apprehensive expression is far from uncommon, particularly when the infection is severe. Often there is a definite body odor. Cyanosis is frequent. The pains in the muscles and bones may diminish with the appearance of the rash. The spleen is enlarged and, if palpable, can often be felt by the third day. Edema, if present, may be generalized but is more frequently limited to the extremities or to the face.

The symptoms most often complained of at the onset are frontal and occipital headache, intense aching in the lumbar region and marked malaise.

The typical rash, which is a manifestation of the specific lesions in the walls of the blood vessels, usually appears on the second, third or fourth day but may be delayed until the fifth or sixth. It is sometimes preceded by a mottled appearance of the skin and is most often observed first on the wrists and ankles and less commonly on the back. Sometimes it is noted next on the forehead. At first it is from pale to bright rose and commonly macular but sometimes papular. If maculopapular it occasionally persists in this form, but it usually becomes macular. It extends rapidly to all or most of the body, including the palms of the hands, the soles of the feet, the scalp and occasionally the eyelids and the mucous membrane of the mouth and throat. It is usually less marked on the abdomen and the face. The color at first disappears on pressure, but later does not, and becomes darker and more or less bluish. The larger and more scattered the spots and the brighter their color remains as the infection progresses, the better the prognosis. Small or pinhead spots that rapidly become darker and more dense indicate a more severe type of infection, and in such cases the rash soon becomes hemorrhagic and more or less confluent and blotchy. When the infection is less severe, successive "crops" of spots are frequently discernible, these crops following each other at intervals of several days. It is not uncommon to receive reports of one, two or three crop cases. After recovery, pigmented areas may be left, which become reddish on exposure to heat or cold or on exertion.

The rash is the visible evidence of the specific lesions in the walls of the blood vessels. These lesions are characterized by proliferation of endothelial cells, local necrosis of endothelium and smooth muscle, and thrombosis. In the more severe attacks and in fatal attacks in which death is delayed, there may be resultant sloughing, the parts commonly affected being the scrotum, prepuce, vulva, dependent portions of the body and buttocks. Sometimes the soft palate is involved.

The febrile period is commonly from two to three weeks but may be shorter or longer. After onset, the fever increases at a rate and degree corresponding to the virulence of the infecting strain. In milder infections the rise is slower and the maximum may not be greater than 103 F. In the highly fatal type of infection the temperature rises more rapidly and to a maximum of from 104 to 106. More or less marked morning remissions are the rule. The maximum temperature usually persists into or through the second week. In patients who are recovering the temperature falls by lysis and most often reaches normal about the middle or end of the third week. In patients infected with variabilis strains, lysis is usually accomplished in three or four days, but in those infected with andersoni strains frequently extends over seven or eight days. In fatal attacks there is occasionally terminal hyperpyrexia, the temperature reaching as high as 108.4 F.

The pulse at first is full and strong and the rate in less toxic patients may not exceed 90 beats a minute. In the more toxic patients it tends to become shallow and the rate may range from 110 to 160. A high pulse rate and a high temperature soon after onset are unfavorable signs.

The lungs are usually not involved, but a slight hacking, nonproductive, bronchial cough is typical.

Restlessness and insomnia are among the pronounced symptoms. Hyperesthesia of the skin and neuritis of varying degrees are common. The patient's mind may

remain unusually clear even in fatal attacks, but more often there is stupor from which the patient is easily aroused or low grade or active delirium. Patients who seem perfectly clear mentally may later have no recollection of the events of their illness. Coma is frequent and may precede death by a few hours or several days. Convulsions, muscular tremor, muscular rigidity and opisthotonos may occur. There may be ankle clonus and a Babinski sign. Kernig's sign may be present. A slight rigidity of the neck is not uncommon.

The tongue is coated but remains red at the edges and may be swollen. Constipation is usually present and persistent, but in some cases there are diarrhea and more or less abdominal distention. Such attacks have been referred to by some physicians as "gastrointestinal." However, they probably result from an infrequent involvement of the capillaries of the intestine and do not represent a distinct type of the disease. Sometimes there is incontinence of the feces. Vomiting is most common during the first few days but may occur later. The liver is sometimes enlarged. Jaundice is not uncommon and in some fatal attacks is a marked terminal condition.

Unfortunately there has been no attempt to compile data pertaining to urologic, blood and other tests for more than small series of cases.

The urine is usually reduced in amount, and the greater the reduction the poorer the prognosis. It is acid and may be very strongly so. Albumin and acetone may be present, especially in the more severe attacks. There may be either complete retention or incontinence.

There are no significant pathologic changes in the blood. The white cell count does not usually exceed 15,000 but may be 30,000. Leukopenia is occasionally present. There is relative mononucleosis. The red cell count may be below or slightly above normal.

The spinal fluid is normal.

Minor differences in the affinities of virus strains for specific tissues are suggested by the fact that certain symptoms or appearances seem to be accentuated in certain regions in which the disease is endemic.

The complications most commonly met with are bronchial, lobar or hypostatic pneumonia, phlebitis, hiccup, and hemorrhages from the nose, intestine or kidneys. Iritis, acute nephritis and hemiplegia occasionally appear.

Convalescence is slow, and complete recovery may require from one to several months—sometimes a year or even longer. This may be true of even relatively mild infections.

Concurrent conditions also due directly or indirectly to ticks may occur; streptococcic septicemia, tularemia and tick paralysis have been reported. Streptococcic septicemia may be the result of secondary infection introduced through the lesion caused by the tick bite. Two instances of concurrent tularemia are known; both patients died early.

A brief statement concerning infections in vaccinated persons is desirable. In most such persons the clinical course is markedly ameliorated and convalescence is much more rapid. The rash is scattered or may even be limited to the extremities or, sometimes, to the legs. It remains relatively bright. Some cases have been of marked interest in that they have afforded clinical evidence of a struggle for supremacy between the body defenses and the virus. A brief clinical course, with a light or localized rash or none, has been followed (on undue exertion after several days of normal temperature) by a second more characteristic febrile period and a more abundant and typical rash. In one case there was a third attack. Infections of the abortive type may also occur, while, on the other hand, a few have been severe. The latter have not been seen in persons vaccinated two or more successive years.

Most textbooks state that there are no sequelae. However, deafness, impaired vision, insomnia, neurosis, anemia and tachycardia occur. Partial intestinal obstruction has been reported after gastro-intestinal involvement. Thrombo-angiitis obliterans has been noted once. In persons of more advanced years the progress of degenerative diseases may be unfavorably affected. Some persons who have recovered from very severe infections seem to lack their former endurance, and in occasional instances the mentality seems less acute.

It has generally been considered that persons who have recovered from a spotted fever infection have a lifelong immunity. Recent data, however, suggest that the degree and the duration of immunity are in more or less direct proportion to the severity of the infection. Certain it is that in at least the cases of less severe involvement protection may not be permanent. Authentic second infections have been reported eight years or more after the first. In some instances these have proved fatal. There is one record of a third infection, but I cannot vouch for its accuracy.

In diagnosis, Rocky Mountain spotted fever is sometimes confused with typhoid, measles, scarlet fever, smallpox, postmeasles encephalitis, purpura haemorrhagica, epidemic cerebrospinal meningitis, secondary syphilis, Colorado tick fever and endemic typhus. Nonspecific reactions that sometimes follow tick bite may simulate the onset of a spotted fever infection, but such reactions subside rapidly after the removal of the offending tick.

There is no specific or standardized treatment; it is symptomatic and supportive. Drugs too numerous to mention have been used orally, intravenously and by injection into the tissues without conclusive evidence of value, in spite of occasional instances of seemingly rather remarkable recoveries. Intravenous medication is used freely by some physicians but with extreme caution or not at all by others. Convalescent serum and transfusions from immune or nonimmune persons have been used, but the resultant data, admittedly meager, suggest that such procedures are ineffective and not unattended by possible danger to the patient.

Probably more patients have suffered from a too free use of drugs than from more conservative therapy. Certain it is that in treating more severe infections it is undesirable to use any measure or agent which will place an additional load on an already overtaxed body.

The line of treatment followed by most physicians of long experience in the care of spotted fever is conservative. Early hospitalization and the most painstaking nursing are considered to be of the utmost importance, and the patient should be spared every possible exertion. Failure of the heart muscle, which frequently occurs early, is anticipated by the use of digitalis. Heart-depressing antipyretics are strictly avoided. Tepid sponge baths, alcohol rubs and frequent enemas are used to reduce fever and to promote elimination. An ice cap to the head is frequently used. Large amounts of fluids are given by mouth, forced if necessary. If there is excessive dehydration, physiologic solution of sodium chloride is given by hypodermoclysis or, perhaps, preferably, by rectum. Alkalinizing salts

are freely used. Codeine is the preferred drug for restlessness and insomnia. Morphine is used only if definitely necessary.

The terms "eastern type" and "western type" of Rocky Mountain spotted fever are frequently used in the literature. To some persons, at least, this differentiation has seemed to rest mainly on the false assumption that the disease in the West is consistently characterized by a higher case fatality rate than that in the East. Though it is likely that there are valid criteria for the differentiation, as suggested, for example, by a comparison of the gross pathologic changes in guinea pigs infected with variabilis and with andersoni strains, a difference in case fatality rate is most emphatically not one of them. Actually in the West the areas of high case fatality rate are relatively small geographically and the number of cases occurring within them is but a small percentage of the total. The majority of attacks in the West range from very mild to only moderately severe.

Laboratory Tests as an Aid to Diagnosis.—In spite of the commonly expressed opinion that spotted fever is an easily recognized infection, errors in diagnosis are made even by those familiar with the disease. Furthermore, it is often not possible to diagnose clinically the very mild infections or the rapidly fatal ones of the fulminating type. Also, as previously mentioned, spotted fever is sometimes confused with other infections. In the areas where both endemic typhus and spotted fever are prevalent there is, of course, an added difficulty. There is therefore a very evident value in confirming the diagnosis by laboratory tests whenever feasible. The three tests ordinarily used are the infection test, the Weil-Felix reaction and the protection, or virus-neutralization, test.

The infection test consists of the injection of blood from a person in whom the disease is suspected into male guinea pigs intraperitoneally. On the whole this is the most satisfactory test for infections by D. andersoni when it is possible to employ it. Blood taken any time before lysis may be used. Whole blood transferred directly from the patient or citrated whole blood is preferable. The amount commonly used is 1 cc. Clotted blood, plasma or serum can be used, but they are less reliable. If the blood is from persons with from moderately severe to fulminating infections, the test guinea pigs show resultant scrotal swelling, reddening and sloughing which is typical. If the blood is from a person with a mild infection, the scrotal reaction may be less marked or even fleeting, and if it is from a person with an exceptionally mild infection the reaction may even be absent. Several cubic centimeters should be used when the infection is of the last type. If there are a febrile reaction and no scrotal swelling, the gtinea pig should later be given an immunity test with virulent virus. In cases of fulminating infection the blood may be taken several hours post mortem if necessary. The gross lesions may be confused with those of endemic typhus. However, if one is thoroughly familiar with these two diseases in laboratory animals, distinctive differences in the gross pathologic changes are apparent if the infections are typical. Surviving animals may be given immunity tests if more conclusive evidence is necessary.

The infection test is somewhat less satisfactory in cases of infection by variabilis because variabilis strains produce scrotal lesions in only occasional guinea pigs.[1]

Intercurrent infections sometimes produce a somewhat similar scrotal reaction. Immunity tests are helpful under this condition.

Unfortunately, the infection test frequently cannot be used advantageously because of the relatively long period which often elapses between the taking of the blood and its arrival at the laboratory. If the interval is more than twenty-four hours or the blood may have been subjected to a considerable degree of heat while in transit, negative results should not be considered as conclusive.

On the whole the most useful and practical test is the Weil-Felix reaction, that is, the test of the patient's serum for agglutinins against O strains of Proteus X19 and X2. These agglutinins are usually present in diagnostic titer in cases of from moderate to very severe infection. The titer of 1:320 is the lowest that can be considered definitely diagnostic. One of 1:160 is highly suggestive but is also encountered in persons with other diseases with sufficient frequency to warrant caution in its interpretation without adequate clinical data. In the average case, two samples of blood are desirable: one taken as soon as spotted fever is suspected and the other between the tenth and the fifteenth day after onset. The first sample is seldom diagnostic and is useful mainly as a control on the second. In most cases the latter shows a diagnostic titer, but if the titer is relatively low the importance of the first sample for comparison becomes apparent. In some instances a significant titer is not present until convalescence is established, and a third sample is then necessary. In the majority of serums OX19 strains are agglutinated in much higher titer than OX2 strains, but in occasional cases the OX2 titer is definitely the higher, and in one locality in Wyoming this seems to hold true in the majority of cases. Reciprocal cross immunity tests made with strains established from patients showing higher OX2 and OX19 titers, respectively, afford no reason to believe that this difference in serologic reactions is indicative of any fundamental specific difference in the viruses concerned. Rarely is there a higher OXK titer. The Weil-Felix reaction does not provide a satisfactory means of differential diagnosis between Rocky Mountain spotted fever and endemic typhus unless rabbits are used. If rabbits are inoculated with the virus of the patient, or of guinea pigs which have been thus inoculated, their serums show both OX2 and OX19 agglutinins in the case of Rocky Mountain spotted fever but only OX19 agglutinins in the case of endemic typhus.

Like the infection test, the agglutination test is of limited value in diagnosing unusually mild infections and those with an early fatal termination.

The protection, or virus neutralization test (that is, tests of convalescent serum to determine its protective value in guinea pigs against Rocky Mountain spotted fever serum virus), is nearly always of diagnostic value. As regularly performed at Hamilton, duplicate mixtures are prepared, each containing 0.5 cc. of serum and 0.1 cc., 0.25 cc. and 0.5 cc. of serum virus, respectively. After standing for a half-hour at room temperature, these mixtures are injected into guinea pigs intraperitoneally, control animals receiving the same amounts of virus. Some serums taken during lysis show definite virus neutralization value, but the most consistent results are secured with samples taken after convalescence is definitely established. In cases of relatively mild infection this test is of more value than the agglutination test and may even give better results

1. In guinea pigs infected with variabilis strains the spleen is less enlarged and less smooth than in those infected with andersoni strains.

110
938

than the infection test. If highly fatal strains of passage virus are employed as a source of virus for the protection test, it is essential to use serum virus rather than the whole blood virus. The latter is frequently so potent that definite protective properties of convalescent serum may be overwhelmed and an apparently negative test be secured. It is also important not to use excessive amounts of virus. This test has more value in cases of Rocky Mountain spotted fever than in cases of endemic typhus.

Whenever possible, it is desirable to make both infection and agglutination tests. The protection test is of value under two conditions: first, if neither of the other tests has been made and, second, as a check on uncertain results given by one or both of these tests.

The Weil-Felix reaction and the protection test are of no value for testing for past infections. The agglutinin titer for Proteus X strains falls rapidly after recovery is complete, and it is a rare patient whose blood serum will show definite virus-neutralizing value a year after illness.

PROPHYLAXIS

Control of the tick carriers of Rocky Mountain spotted fever has not proved feasible except perhaps under highly localized and special conditions. There are therefore but two avenues for preventing infection with Rocky Mountain spotted fever: first, personal care; second, vaccination. Under personal care are included the avoidance of tick bites, the wearing of suitable clothing and the early removal of any ticks which may become attached to the body.

Of course, the best method of avoiding infection is to stay away from known infected areas. This is not possible, however, for a large part of the population in many affected regions. Furthermore, any section in which a tick carrier is present is potentially dangerous, and each year cases are being reported from areas in which the disease was hitherto unsuspected of being endemic.

In regard to suitable clothing there is but one point of first importance, namely, the wearing of apparel that will prevent ticks from attaching to or crawling up the legs. For this purpose high boots, leggings, puttees and socks that are worn over trouser legs are all of real value. The ticks, which usually transfer from vegetation to the clothing at a height of less than 18 inches from the ground, will then crawl up the outside surface of the clothing, and most of them can be seen and removed. Those that reach the back of the neck, as many do if not discovered, even if entrance through the clothing has been made at some lower point, will usually be felt when they touch the skin or hairs on the neck. It is good practice when in dangerous country to pass the hand over the back of the neck occasionally to feel for ticks.

Ticks are far more likely to secure a hold on rough clothing than on clothing of smooth texture. Each type of clothing has its advantages, however. The progress of the tick is impeded by the nap of rough cloth, but fewer ticks secure a hold if the cloth is smooth.

Women who go into dangerous areas temporarily for camping or other purposes should, whenever feasible, wear men's attire similar to that suggested.

If one is continually in tick country, some ticks will reach the body in spite of all precautions. It is necessary therefore that the foregoing measures be supplemented by the examination of the body and the inside of the clothing. Ticks seldom attach at once, and, since they but rarely transfer infection until they have fed for several hours, examinations made twice a day, at noon and on retiring, are usually sufficient. In particularly dangerous areas, however, more frequent examinations are indicated, or, at least, any local irritation should be investigated to determine the cause.

When one retires, all clothing should be removed. This is mentioned because of the common habit among campers and many persons working outdoors of wearing part of the daytime garments at night. Both the body and the clothing should be carefully examined, and the latter should be so placed that any undiscovered ticks are unlikely to crawl from it to the bed. Exceptional care should be used when two persons occupy the same bed. If an infected tick becomes detached from one and attaches to the other, infection of the latter may take place quickly because the virus has already been reactivated. Instances of double infections caused in this manner by a single tick are far from uncommon. In one known instance three persons were thus infected.

Those who are exposed for only a few hours or for part of a day would do well to make a complete change of clothing on reaching the home, and the removed clothing should be so cared for that any unobserved ticks will not be a danger to other members of the household or to other persons.

Clothing placed on the ground attracts ticks from some distance and should be carefully examined before being put on. Ticks will crawl to persons who remain in small circumscribed areas for shorter or longer periods, such as, for example, persons sitting or lying on the ground. Persons sleeping outdoors should use care in selecting a camp or bed site. In this connection, one should bear in mind that ticks are usually more numerous where rodents are more abundant. Such places should be avoided. Within the range of the Rocky Mountain wood tick, one of the safest camping locations is in timber, particularly where low vegetation is scanty, but, on the other hand, open areas in timber may be dangerous. In sagebrush country one should keep away from the sagebrush. Proximity to trails and old roads should be avoided. Particular care should be exercised by persons following trails, since ticks tend to congregate on the vegetation on each side or on the upper side of trails that cross slopes. Grassy strips in the middle of little-used roads and vegetation along road sides are often heavily tick infested.

If a tick is found attached to the body it is best to remove it immediately. This is desirable because every added moment of attachment increases the danger of spotted fever or other tick-borne infection. Many practices have been employed for removal. However, the desired result is most easily and quickly accomplished by gently pulling the tick off with the fingers. So far as the ticks that transmit spotted fever are concerned, there is little ground for the idea that the mouth parts will thus be left in the wound, in spite of popular opinion to the contrary. Better the mouth parts, however, than spotted fever, tularemia or some other equally unattractive infection. However, there is a definite danger of breaking off the mouth parts of ticks which have a longer hypostome, such as, for example, Ixodes ricinus californicus, which is prevalent in parts of the west coast of the United States and Canada, and Amblyomma americanum, common in parts of the South Central and South Atlantic states.

When sterile instruments are at hand, ticks of any species may be removed easily by pulling the tick gently

so as to make a tent of the skin surrounding the site of attachment and then slipping the point of a hypodermic needle or scalpel under the mouth parts. The instrument is then raised, thus removing the mouth parts with a minimum of tissue. However the tick is removed, iodine or some other agent for asepsis should be applied to the site of the bite. A silver nitrate pencil, which can be purchased for ten cents at any drug store, is convenient for outdoor use.

There is no proved satisfactory material which can be placed either on the clothing or on the body to prevent tick attachment.

The United States Public Health Service vaccine for Rocky Mountain spotted fever is prepared at, and distributed from, the Rocky Mountain Laboratory of the National Institute of Health at Hamilton, Mont. So far as it is available, it should be used by those who live in or frequent dangerous areas. Unfortunately this vaccine, which is prepared from the tissues of infected Rocky Mountain wood ticks, is difficult and expensive to produce, and at the present time it is possible to manufacture annually enough for only about 80,000 persons. The cost exceeds $300 a liter.

This vaccine is used in two 2 cc. doses given five days apart either subcutaneously or intramuscularly. For the most part the reaction is local, but in some persons it is constitutional and occasionally severe. Anaphylaxis is rare. The data indicate that the majority of persons are fully protected against the less virulent strains of Rocky Mountain spotted fever but that the average person is only partially protected against the highly fatal type. The maximum degree of protection conferred is retained for less than one year.

During the thirteen years in which the vaccine has been in use fifty-nine persons have been infected the same year in which vaccine was administered. Thirty-three were adults infected in the western Montana area of highly fatal infection (fifteen were laboratory workers, and eighteen were infected spontaneously); three attacks proved fatal, a case fatality rate of 9.09 per cent. During the same period in the same area fifty nonvaccinated adults were infected; thirty-eight died, a case fatality rate of 76 per cent. The fatality rate in this area, therefore, has been approximately 66 per cent lower for the vaccinated group. The remaining twenty-six persons infected the same year in which they were vaccinated acquired infection in areas where the disease is less severe; none died.

In addition to these data there are records of thirty-five cases in which infection took place from one to seven years after vaccination. Of twenty persons infected from one to one and one-third years after vaccination, none died, but three of the remaining fifteen died. They had received vaccine two, three and four years, respectively, before infection. Two of these were infected in western Montana.

The conclusions drawn from the use of this vaccine to date are briefly summarized as follows:

The vaccine has definite protective value. The degree and the duration of protection vary with the person vaccinated and with the degree of virulence of the infecting strain of spotted fever virus.

The average person vaccinated in the spring retains marked immunity during at least the remainder of that year. The immunity is usually sufficient to afford full protection against the relatively mild strains of spotted fever but is apparently progressively less effective as the virulence of infecting strains is increased. Regarding the highly fatal type, the data suggest that most children are fully protected but only occasional adults. In the majority of the latter, however, protection is sufficient to ameliorate markedly the usual severe course of infection and to insure recovery. Hospitalization and nursing care are decided aids to persons in whom there seems to be a delicate balance between the degree of protection conferred and the aggressiveness of the infecting strain.

If a person is infected during a period beginning several days after the first injection but before the full degree of immunity has developed after the second or third, there is a strong probability that the subsequent clinical course of the disease will be affected favorably, even in areas of high case fatality rate.

In areas where relatively mild infections prevail and the incubation period is prolonged, the administration of vaccine as soon as possible after tick bite may ameliorate an impending infection. This appears particularly probable in the case of persons who have been vaccinated in one or more previous years. The procedure is not recommended in areas of highly fatal infections where the incubation period is short unless the person has been previously vaccinated.

It now seems probable that a considerable percentage of vaccinated persons carry a greater or less degree of immunity over into the second year even against highly virulent strains. The degree of this residual immunity appears to be greater in persons who have been vaccinated two or more successive years. The evidence as to whether any immunity is carried beyond the second year is less definite. Until further and more definite data are available, it is necessary to recommend that vaccination of exposed persons be repeated each year.

Of persons vaccinated and infected the same year, those who have received vaccine two or more successive years appear to have greater resistance than those who have received vaccine only one year. The usual dose can probably be halved for persons who have been vaccinated at least three successive years.

CONCLUSION

Rocky Mountain spotted fever is only one of several tick-borne diseases endemic in North America. Tularemia is widespread in the United States and has been recognized in several widely separated points in Canada. It is transmitted to man by both the Rocky Mountain wood tick and the American dog tick, perhaps by Ixodes ricinus californicus along the Pacific coast, and by other means. In nature it is carried by the rabbit tick and probably by the bird tick, H. cinnabarina. The last species infests only birds. Several other species have been shown to be potential carriers.

Tick paralysis is a more localized problem and is reported sporadically from parts of Oregon, Washington, Idaho and Montana but is perhaps most prevalent in southeastern British Columbia. Rare cases occur in Wyoming. As far as known, it is caused only by the female Rocky Mountain wood tick.

Colorado tick fever is another disease transmitted by the Rocky Mountain wood tick. It has been reported most often from Colorado and Wyoming but is present also in Utah and Idaho and probably has an even wider occurrence. Suggestive cases have been reported from California.

Relapsing fever is now known to be endemic in several Western states and in southeastern British Columbia and, like Colorado tick fever, will probably be found to have an even wider distribution. At least two ticks of the genus Ornithodoros, turicata and hermsi, are involved in its transmission.

110
938

A new filter-passing agent, recently found in the Rocky Mountain wood tick by Dr. Gordon E. Davis and Dr. Herald R. Cox of the Hamilton Laboratory, has still more recently been identified in Dermacentor occidentalis in southwestern Oregon and in California. It unquestionably causes a rodent disease and possibly one to which man is susceptible. It may be represented by some of the numerous unidentified disease conditions reported each year as following tick bite; in fact, three suspicious infections have recently been observed.

Secondary infections may occur as a result of the bites of the ticks thus far mentioned as well as of others. These sometimes result in chronic lesions, septicemia, loss of limb or, occasionally, death.

These other disease conditions tick borne and caused by tick bite have been briefly referred to because many of the observations concerning them have been made within relatively recent years and because, along with the data relating to Rocky Mountain spotted fever, they show that there is in North America a general tick and disease problem of widening scope geographically, from the standpoint of disease entities, and regarding the number of species of ticks involved.

This problem is most serious in the West, where topography, climate and the limitations otherwise imposed on economic development have favored the persistence of essentially natural floral and faunal conditions over vast areas. These in turn have fostered, and will likely continue to foster, the maintenance and perpetuation not only of such diseases of nature as those herein discussed but also of considerable populations of the ticks and the other parasites which transmit them to man.

RIBOFLAVIN

DIETARY SOURCES AND REQUIREMENTS

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This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. The articles will be published later in book form.—ED.

At the time of the preceding symposium in 1932, the terms vitamin B_2 and G were used synonymously by Sure [1] as standing for the more heat stable part of the vitamin B complex; and Underhill [2] wrote of vitamin G deficiency as "intimately associated with the complex syndrome of symptoms included under the term pellagra." At the time of the present writing (the summer of 1937) the evidence appears conclusive that there are at least three relatively heat stable substances in the vitamin B complex: (1) riboflavin; (2) vitamin B_6; and (3) another substance which perhaps may be considered P-P or the Goldberger pellagra-preventive substance, which may or may not be the same as the substance which prevents blacktongue in dogs. (It is also held by some careful students that more than one substance may be involved in the nutritional problem of human pellagra, even when this is distinguished from all so-called pellagra-like disorders in other species.)

Riboflavin and vitamin B_6 are both required for growth and for the maintenance of health in the rat and probably in mammals generally, including man. The fact that we do not know any specific human disease due to shortage of riboflavin is entirely compatible with the view that this substance is important in human nutrition. A detailed discussion of reasons for believing that riboflavin plays a rôle in the life process of the human as of other species would probably seem superfluous to a majority of readers at this date, and to a still larger majority in the future. Suffice it to point out that our species has evolved in the direction not of shortening the list of things it needs but of lengthening the list of things it can use to advantage.

Shortage of riboflavin stunts the growth of the young and at any age causes a lowering of general tone and a condition of premature aging or unwholesomeness of the skin, with loss of hair. The skin condition has sometimes been called a "nonspecific" dermatitis or dermatosis as distinguished from the "florid" dermatitis of vitamin B_6 deficiency.[3]

The substance here called riboflavin was first described as lactoflavin (previously called lactochrome).[4] Ovoflavin and hepatoflavin, first so named for the materials from which they were prepared, were soon found to be chemically identical with lactoflavin.

The same substance has also been reported as isolated from several other sources as widely separated biologically as the milk of different species, muscle, liver, kidney, eggs, fish eyes, malt, grass, dandelion flowers, and both marine and fresh water algae as typified by Fucus vesiculosus and Cladophora sauteri (Karrer;[5] Heilbron, Parry and Phipers [6]).

DIETARY SOURCES OF RIBOFLAVIN

Corresponding with the wide biologic distribution of riboflavin in the plant and animal kingdoms as just mentioned, it is found more generally present in significant amounts among varied food materials than is vitamin A but less abundant in the seeds which form so large a part of man's food than is vitamin B_1. It is doubtless true, as suggested by Eusterman and Wilbur [7] in the previous symposium, "that certain individuals, the poor in particular, do not consume enough foods that contain [significant amounts of] vitamin A and vitamin G to insure a state of nutrition essential to the greatest physical stamina, efficiency and ability to resist infectious diseases." In fact, this view is strongly reenforced by the experimental finding [8] that the optimal intake of vitamin G (riboflavin) is very much (probably at least fourfold) higher than is easily demonstrable as strictly necessary.

The relative amounts of riboflavin in foods are therefore a matter of importance to health and should be given weight in present-day considerations of food values and planning of the dietary.

From the Department of Chemistry, Columbia University.

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3. Chick, Harriet; Copping, Alice M., and Edgar, Constance E.: The Components of Vitamin B_6, Biochem. J. **29:** 722 (March) 1935.
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From longer lists published elsewhere [9] and from data reported by Daniel and Munsell [10] we selected for table 1 some typical foods, including those which have thus far been most thoroughly studied in this respect.[11] Some of these deserve additional brief comment.

TABLE 1.—*Approximate Riboflavin Values of Certain Foods* *

	Units† per 100 Gm.
Apples	10 to 43
Bananas	26 to 50
Beef, lean	90 to 150
Carrots	30 to 75
Carrot tops	200
Cheese	44 to 288
Cottonseed flour or meal	170 to 300
Eggs	99 to 150
Egg white	60 to 120
Egg yolk	150 to 300
Kale	140 to 200
Liver	800 to 1,200
Milk	34 to 100
Oranges	15 to 65
Potatoes	15 to 31
Spinach	100 to 175
Tomatoes	12 to 28
Turnips	17 to 50
Turnip greens	300
Wheat, entire	48 to 124
Wheat germ	150 to 404
Yeast, dry	750 to 2,500

* Selected from among the data on pages 415 to 417 of Sherman's Chemistry of Food and Nutrition, ed. 5, 1937, from Daniel and Munsell [10] and from Levine and Remington.[11]

† These units are Sherman-Bourquin units of vitamin G determined by the rat-growth method of Bourquin and Sherman [13] and of Page,[15] as more fully explained below.

Riboflavin appears to be formed primarily in the green leaves of actively growing plants and to remain there in higher concentration than elsewhere in the plant. Thus, of the three tissues constituting the edible portion of broccoli, the flower buds contain only a little over half as much riboflavin as the leaves, and the twigs still less. Similarly, carrot tops show something like four times the riboflavin value of the roots. This concentration of riboflavin in the green leaves where it is formed presents an interesting contrast to the transfer of carotene from leaf to root which occurs in the carrot.

There are indications that, as the leaves mature and dry, there may be a considerable diminution in their riboflavin value. Correspondingly it was found at the Ohio Agricultural Experiment Station [12] that milk from cows receiving an abundance of fresh young grass tended to be slightly richer in riboflavin than the milk of cows fed drier and more mature grass; but in milk as ordinarily produced under present-day conditions of dairy farming seasonal variations of vitamin value are much smaller than would be inferred from many of the statements in the literature. Perhaps the best present evidence in this case is expressed in the figures of the seventeen available quantitative results of ten independent investigations. These show an average of 67 ± 3 Bourquin-Sherman [13] units of riboflavin per hundred grams of milk, with a coefficient of variation of 28, which is a lesser variability than would perhaps have been expected. Nor should there be any serious diminution of the riboflavin value of milk in pasteurization or in preservation by drying or by condensation (partial evaporation) and canning. Milk is thus a relatively stable and dependable source of riboflavin and will almost always be the chief source in the dietaries of children because of the prominence that should be given to milk in the dietary for other nutritional reasons as well. In any long view of food economics there is also the consideration that milk is a food crop the production of which can be greatly increased in response to consumer demand, with little if any increase in cost per unit to the consumer.

A contrasting case in this respect is that of liver, the supply of which can be increased only by rearing and slaughtering whole animals of which the liver is only a very minor part. Hence (as Minot, if we remember correctly, has complained) any emphasis on liver as a food for people in general has the unfortunate result of increase in its cost to those who really need it.

György [14] has made semiquantitative comparisons of the riboflavin values of some different flesh foods. He finds fish muscle a poor source of riboflavin, compared with beef and chicken muscle, which he finds to contain about equal concentrations. The red leg muscle of chicken appeared to contain slightly more than the white breast muscle; but this difference does not appear sufficient to justify discrimination in a practical consideration of dietary sources. In György's experiments, beef liver appeared about fifteenfold richer than beef muscle, while in the apparently more precise experiments of Day [15] and of Munsell [10] liver showed about tenfold higher riboflavin value than did an equal weight of muscle.

Rose and Phipard [16] recently found that fresh raw peas and lima beans contain about 100 units of riboflavin per hundred grams and observed no loss in either cooking or freezing. In mature seeds of both kinds there appeared to be little diminution in vitamin G (riboflavin) value as compared with the fresh seeds. Pea seedlings showed an increase in riboflavin content over the seeds from which they were sprouted.

TABLE 2.—*Relative Prominence of Certain Types of Food* * *(in Dietaries Costing from $2.38 to $3 Weekly per Food-Cost Unit)*

Food or Food Group	Per Cent of Food Money Allocated	Percentages Contributed by Each Food Group to the Total Secured: Calories	Protein	Calcium	Vitamin A	Vitamin C	Riboflavin
Meats and fish	25.5	12.9	36.2	2.7	7.1	0.7	32.2
Eggs	5.0	1.7	4.9	2.7	6.0	...	5.3
Milk, cheese, ice cream	12.1	9.8	16.0	60.7	13.9	5.3	34.2
Butter, cream	7.6	9.3	0.4	1.4	16.0	?	0.4
Other fats	3.0	7.8	0.5	0.1	0.8	...	1.1
Breadstuffs, cereals, bakery products	17.6	30.3	27.3	12.0	3.5	0.6	5.7
Sugar, sweets	4.2	12.4	0.1	2.1	...	...	...
Potatoes, sweet potatoes	1.5	3.8	4.4	3.4	2.6	22.8	7.2
Dried legumes, nuts	1.8	2.9	5.3	3.4	0.2	...	0.8
Tomatoes	1.5	0.3	0.4	0.5	9.5	7.8	0.6
Citrus fruits	3.2	1.1	0.5	3.0	0.6	29.6	3.3
Green and yellow vegetables	3.9	0.8	1.4	3.4	33.7	12.8	3.7
Other vegetables	3.4	1.0	1.0	2.8	1.3	8.1	1.2
Other fruits	3.9	2.8	0.7	1.4	4.6	12.3	3.9

* Adapted from Stiebeling.[17]

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16. Rose, Mary S., and Phipard, Esther H. F.: Vitamin B and G Values of Peas and Lima Beans Under Various Conditions, J. Nutrition **14:** 55 (July) 1937.

In practice, the actual importance of any given food as a dietary source of riboflavin (or of any other specific nutrient) depends of course not only on the concentration of the substance in the food but also on the place (or quantitative prominence) of the food in the dietary or food supply. Stiebeling [17] has ascertained the relative place of different dietary articles in food budgets and has computed what proportion each contributes of the total of each of several nutrients thus secured. The data for riboflavin and some of the other nutrients are given in abbreviated form in table 2.

It seems sufficiently established that the Bourquin-Sherman method for the measurement of "vitamin G values" measures riboflavin rather than any other factor—and consistently so when the method is carried out strictly as described by its authors. This has been found independently by several users of the method but, of course, should not be assumed for any cases in which the method is modified, especially as to the preparation and use of the 80 per cent alcohol extract of wheat as a source of vitamin B_1, B_6 and any still unknown "B factors" needed by the rat. Even when the Bourquin-Sherman directions are explicitly followed, the adequacy of the extract to this purpose should be tested by each laboratory on the materials (and test animals) which it uses; for the vitamin B_6 value of wheat is reported to be subject to wide variation as tested in different parts of the world.[18] The amount of riboflavin which the Bourquin-Sherman "unit of vitamin G" represents has been estimated as from about 3 to 5 micrograms. The chief causes of this variation, so far as present knowledge suggests, are (1) differences in purity of previously available preparations of riboflavin, (2) variations of riboflavin requirements with the size of the test animal, (3) completeness of prevention of coprophagy,[19] and (4) the possible influence of some less well defined difference in the nutritional background of the test animal or in the bacteriology of its environment, which may influence the precise amount of riboflavin needed or absorbed with a given diet, even when all mechanical precautions for prevention of coprophagy are observed.

DIETARY REQUIREMENT FOR RIBOFLAVIN

As yet, estimates of the amounts of riboflavin required for normal human nutrition are necessarily matters of judgment rather than of actual direct measurement. The independent judgments of Rose [20] and of Stiebeling [21] are in substantial agreement and are probably the most influential estimates thus far available. Rose has suggested for children up to 10 years of age at least 400 units a day in all cases, or 20 units per hundred calories if more than 2,000 calories a day is consumed; for adults, 20 units per hundred calories. The recommendation of Stiebeling is 450 units for boys under 6 and girls under 7 years of age, 540 units for boys from 7 to 10 and girls from 8 to 13 years of age, and 600 units for older children and adults, or 570 units per capita of the population.

How far above these allowances the actual optimum will be found is a question for the future.

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Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

THE PRESENT STATUS OF SHORT WAVE DIATHERMY

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About two and a half years ago, in a preliminary report for the Council on Physical Therapy, I [1] pointed out that, with further clinical investigation, short wave diathermy might prove to be a useful therapeutic agent. Sufficient additional data are now available to warrant a further report. From the published mass of conflicting opinions, one may now winnow enough information to draw a number of additional conclusions.

DEFINITION

Short wave diathermy may be defined as the therapeutic heating of the bodily tissues by means of an oscillating electric current of extremely high frequency (from 10,000,000 cycles per second and a 30 meter wavelength to 100,000,000 cycles per second and a 3 meter wavelength).

NOMENCLATURE

A confusing variety of terms have been suggested to describe such radiation, among them being "short wave therapy" and "ultra-short [2] wave therapy" (Schliephake [3]) "radiothermy" (Bierman [4]) "radiathermy" (Kobak [5]), "parathermy" (Turrell [6]), "neodiathermy," [7] "short diathermy" and "ultra-diathermy" [2] (Nagelschmidt [8]), "short" and "ultra-short [2] wave diathermy" and "short wave diathermy." Although there is merit in a number of these designations, the one last mentioned, "short wave diathermy," has been generally considered in the United States as being most acceptable, since these waves are short only in juxtaposition to conventional diathermy and since they may probably be best considered as another form of diathermy. The Council on Physical Therapy considers "short wave diathermy" acceptable terminology.

HISTORY

D'Arsonval's [9] presentation of his experimental data to the Academié des sciences in 1892 constituted the first basis for the application of high frequency currents in medicine. Following the development by De Forest of the triode principle of electronic oscillations,[7] the studies of Gosset and his co-workers [10] in 1924 are considered to be the first scientific investigation of the effect of the oscillating field on living cells. The studies of Schereschewsky [12] (1926) in this country, indicating a specific lethal action of short wave diathermy, later appeared to be disproved by the investigations in 1929 of Christie and Loomis [13] and by those of Kahler and his co-workers.[14] Still later, following Whitney's work at Schenectady, Boak and her co-workers [15] began their outstanding studies which led to the use in the United States of short wave diathermy for the production of therapeutic fevers.[16]

Meanwhile in Germany Esau [17] was beginning studies in 1925 which caused Schliephake [18] to credit

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Owing to lack of space, this article has been abbreviated here by omission of the bibliographic references. The complete article will be available in the reprint.
2. If the wavelength is less than 12 meters, the "ultra" prefix is used.

V 11
1938

him with having first introduced short wave diathermy devices of sufficient power for satisfactory therapeusis. Pätzold [19] likewise is credited by German writers [20] with having made important contributions on the physics of short wave diathermy.

Unfortunately, these early studies were followed by many pseudoscientific, hyperenthusiastic presentations. Kovács [21] decried the fact that many investigators rushed into print with premature conclusions, and Eidinow [22] pointed out that many workers, in their zeal, had made observations which could not be confirmed.

APPARATUS

The appliance for the production of short wave diathermy fields resembles in construction a short wave radio transmitter, with the exception that the electrical energy, instead of being dispersed from antennas as in broadcasting, is mostly confined between condenser plates to produce an electric field, or within a coil to produce an electromagnetic field.

Bodily tissues, acting partly as conductors and partly as dielectors when placed within these fields, are allegedly heated by the production of ionic oscillations and molecular friction. Power losses occur. The entire phenomenon, therefore, is customarily designated as "hysteresis." DeWalt [23] has suggested a simple simile to illustrate the manner of heating of dielectrics by short wave diathermy. He stated that the rubbing of a rubber band with the fingers produced heating of it by surface friction and that this might be compared to the heating produced by a current flowing through a substance which offered ohmic resistance. On the other hand, if one should hold the rubber band at the ends and stretch it back and forth, heat would be produced by molecular friction inside the band. This result may be compared to the effect taking place when a high frequency field produces molecular friction and heat losses within a substance which acts as a dielectric.

Two types of apparatus are commonly used, the vacuum tube (or valve) machine and the spark gap device.[24] Holzer and Weissenberg [20] have described a third type, an inexpensive "low output generator," which Weissenberg [25] used for "low intensity treatments"; however, I am inclined to agree with Taylor,[26] who said it seemed that the so-called low energy apparatus could have "no effect other than a psychological one." The consensus seems to be that short wave diathermy machines, to be effective, should have a fairly high output in watts.

Vacuum Tube vs. Spark Gap Apparatus.—There is much disagreement concerning the relative effectiveness of vacuum tube and spark gap machines. Speeding [27] felt that spark gap machines were inefficient, and Wilson[28] believed that they possessed a definitely restricted field of action. Holzer [29] said their voltage curves varied considerably and that precise indication of wave length was impossible. Chaffee [29] said that they had been made practically obsolete by the vacuum tube machine and that for the same degree of heat the damped currents produced higher instantaneous voltages, which favored the production of burns. On the other hand, the undamped current was smooth and continuous and had a minimum tendency toward sparking. From the opposite point of view, when properly constructed, a spark gap apparatus may be very effective. Bierman [30] has used one with considerable satisfaction. Likewise, Webster [31] felt that Wilson's criticism of the spark gap machine was unjustified and premature, since he had used one with gratifying results. Although, after several years of trial of a number of these machines, I have had more technical difficulties with them than with tube appliances, I am not prepared to condemn them as unsatisfactory. One may conclude, nevertheless, that most observers prefer the tube apparatus.

SHORT WAVE DIATHERMY VS. CONVENTIONAL DIATHERMY

In support of the superiority of short wave diathermy over conventional diathermy, it has been said that the former would produce more intense, less hazardous local heat (Davis [32]), that it penetrated certain bodily layers, which were avoided by conventional diathermy (Schliephake [33]), that it had a greater range of flexibility and more profound physiologic action (Kobak [34]), that it was more efficient and rapid in action (Wilson [35]), and that, although diseases rationally treated by heat respond as well to conventional diathermy when the lesions are superficial, deeply situated parts in the thorax and abdomen are better heated by short wave diathermy (Cumberbatch.[36]). Wilson [37] reached the questionable conclusion that short wave diathermy was effective in treating suppurative lesions, whereas conventional diathermy was dangerous. Taylor [26] felt that short wave diathermy had the advantages of a deeper heating effect and avoidance of high field concentration around the electrode.

Egan [38] said that short wave diathermy should not be considered as modified conventional diathermy. Speeding [27] stated it as his belief that the effects of the former were not identical with those of the latter. On the other hand, d'Arsonval has been quoted [9] as saying that "there is no wall separating diathermy from short waves." Nagelschmidt [8] pointed out that there were no sudden marked differences in the effects produced by radiations of nearly related wave lengths in other portions of the spectrum, and that none could be expected in this instance. Furthermore, Kovács [21] stated that, since there was no essential difference between the primary physical effects of the two, one could not expect much difference in their physiologic and therapeutic effects. He felt that short wave diathermy was more convenient to use but that the lack of a proper method of determining dosage was a distinct disadvantage. Kowarschik [39] reported (1933) comparisons of the effects of these two methods on cadavers, which experiments led him to state that it was wrong to assume that short wave diathermy produced relatively greater heating than conventional diathermy. His more recent studies [40] indicate that he credits short wave diathermy with many favorable effects.

Turrell [41] was not of the opinion that short wave diathermy produced improved or increased thermal action as compared with conventional diathermy. Schmidt [42] felt it was unlikely that the former would replace the latter. Eidinow [43] found no results with short wave diathermy which could not be produced by conventional diathermy. Hollender [44] said that no more could be claimed for short wave diathermy than for conventional diathermy; with either there was simply heat production, but in the case of the former there was deeper penetration and more facility of application. Clinically I have observed no particular difference in the effects produced, but I have been pleased with the convenience of short wave diathermy. The consensus seems to be that there is no great difference in the effects produced by these two forms of diathermy, but that short wave diathermy produces deeper, more uni-

form heating and is more readily applied, although dosage control is more difficult than with conventional diathermy.

PHYSICAL EFFECTS OF SHORT WAVE DIATHERMY

Selective Heating.—There has been much disagreement concerning the problem of selective heating by short wave diathermy. It is frequently stated that certain selective "point heating" effects can be demonstrated in vitro. Esau's [45] often described experiment on alkalinized water shaken with liquid petrolatum is a typical example. When this emulsion was placed in a condenser field, the temperature increased and it finally began to steam, indicating that the water had "been heated to 100 C." although the temperature of the entire solution was only 60 to 70 C.[34] Whitney's [46] heating of tadpoles in distilled water, which remained comparatively cool, is presented as another example of selective heating. Selective heating of non-living substances has been demonstrated by Schliephake,[47] Mortimer [48] and Bachem.[49] Using such examples, enthusiasts have contended that marked in vivo selective heating effects on various bodily structures can be effected by proper selection of wave length.

Starting with the studies in 1931 of McLennan,[50] who theorized that, if the dielectric constants of various parts of the body were different, "heating of one member" might be favored by proper orientation, various claims have been advanced:

Schliephake,[51] for example, contended that a unique property of ultra-short waves was their selective thermal action and that it was possible that some parts of tissues—for example, cells, intercellular substances, nuclei and protoplasm—might be affected in different degrees according to their composition. Breitweiser [52] said that there existed, for each combination of wave length and dielectric constant, a particular resistance for which the heating would be a maximum. Bierman and Schwarzschild [39] pointed out that, with the exception of fat, all human tissue has practically the same dielectric constant. They felt that there was a tendency for more uniform heating at higher frequencies but that it was possible to heat a certain type of tissue more than others.

Pratt and Sheard,[53] concluded that, in the living animal, tissues are heated to different degrees by the systemic application of the short wave electric field. (It has been suggested, however, that their use of thermocouples in the field may have produced the variations noted.)

Mortimer's [48] studies indicated that, in live anesthetized dogs with the viscera exposed, the different organs heated up at approximately the same rate, the blood serving as a very efficient distributing mechanism, whereas, in dead dogs, different organs heated at different rates. Bierman [4] questioned the occurrence of selective heating in the living animal, and Chaffee [29] believed that the circulation of blood was a powerful agency toward equalizing the bodily temperature. Wolf [54] said substances with different dielectric constants obviously were heated to different degrees, but that, in the living human being, the slight variations in dielectric constants were equalized by the circulation. Coulter and Osborne [55] said that a selective heat production could readily be demonstrated in inorganic substances and dead tissues, but that in the living animal, owing to dissipation of heat by an efficient circulation, no selective heating could be expected. Kovács,[21] Eidinow,[22] and Mortimer and Osborne [56] expressed similar negative views with regard to the possibility of selective heating in living tissues.

Coulter and Osborne [55] demonstrated by means of pelvic heating experiments a lack of specific heating for various wavelengths. From a clinical standpoint I have observed no obvious selective heating effects. The consensus would seem to have been well expressed in a recent report of the Council on Physical Therapy [57] that, so far as competent investigators have been able to determine, there is no demonstrable selective thermal action in the living body.

Thermopenetration.—With regard to penetration of heat during applications of short wave diathermy, marked differences of opinion have been noted. Schliephake [58] claimed that heating took place "from within outward" and that there was superior penetration with short wave diathermy. Bierman and Schwarzschild [30] claimed more uniform heating with higher than with lower frequencies. Pätzold [59] believed that, with the uniform field distribution made possible by higher frequency and wider air gaps between electrodes and bodily surface, the temperature in the interior of the body and at the surface could be "of equal magnitude." Reiter [60] said that, with short wave diathermy, deep heating could be produced as a result of dielectrical losses deep within the body. Pratt and Sheard [61] concluded that the relationship of deep heat to surface heat was dependent on the distance at which the condenser plates were placed with respect to the surface. With more air space, deep heat was greater than superficial heat, whereas with less air space the reverse was true.

Mortimer and Osborne,[56] however, reported a thermal gradient from hot skin to less hot tissues within and concluded that there was no evidence that short wave diathermy possessed more uniform penetration of heat into the body than conventional diathermy. Kobak [7] felt that the differences between the observations of Pratt and Sheard and those of Mortimer and Osborne were due to differences in the methods of spacing between electrodes and the body surface.

While laboratory studies have elicited conflicting views, many clinical observations have indicated failure of deep heating with short wave diathermy. Thus, Schultze-Rhonhof and Rech [62] applied short wave diathermy electrodes to the pelvis, front and back, and concluded that there was no pronounced increase of internal temperature, as measured by alcohol thermometers, although a noticeable heating of the skin was observed. Coulter and Osborne [55] confirmed these observations, concluding that the surface tissues could not tolerate the excessive heating necessary to produce adequate deep heating. Cumberbatch [36] also reported that he could not heat the interior of the pelvis with external applications of short wave diathermy. I have found, however, that, in conjunction with fever therapy, it is possible to raise the internal temperatures of the pelvis several degrees by applying short wave diathermy with a bare metal vaginal electrode, as described by Horowitz and his co-workers.[63]

Eidinow [43] said that the greatest heating appeared to be centered in the fatty tissues and Chaffee [29] wrote that, while the so-called cutaneous effect was negligible when the body was the conductor, nevertheless it was fairly well established that the surface of the body was more intensely heated than the interior.

My clinical observations show very little difference between the heating effects of conventional and of short wave diathermy.

The consensus would seem to be that for various physical reasons short wave diathermy should produce more uniform and deeper heat penetration than conventional diathermy. But for reasons which at present must be purely a matter of conjecture, many clinical observations have not confirmed this opinion.

Wavelengths.—Various observers are in marked disagreement concerning the possibility of the production of diverse effects by different wavelengths between 3 and 30 meters. For example, McLennan [50] thought that, by choice of wavelength, heating of portions of the body having a certain conductivity might be favored. Schliephake [18] claimed that "unpleasant sensations" were produced sooner by 3 meter waves than by 7 meter waves, and he said also [64] that staphylococci were killed in the condenser field at different rates of speed according to wavelength. He also affirmed [33] that if with a wave of 4 meters the muscle was heated more and the fat less, with another wavelength the fat might be heated more than the muscle. Liebesny [65] said that with 4 meter waves he had cured actinomycosis in two cases in which the condition had been unaffected by waves of 15 meters. Reiter [66] believed there existed for every tissue an optimal wavelength, and he also said [60] that, with equal primary energies, one ought to get the most heat with the shortest wavelength. Bierman and Schwarzschild [30] contended that it was possible by proper selection of frequency (or wavelength) to heat one type of tissue at the expense of another, and that a frequency of 30,000,000 cycles per second heated lung tissue most, whereas a frequency of 75,000,000 cycles heated cartilaginous tissue most.[67] Breitweiser [52] said that selective effects were more pronounced with ultrashort waves. Kobak [68] was of the opinion that the best clinical results were obtained with apparatus of high wattage output in an ultrashort wave range. Gale [69] believed the question of optimal wavelength was not settled yet.

On the other hand, Nagelschmidt [8] said that there was never a sudden change of the effects of adjacent wavelengths within the entire range of diathermy, and further that,[70] clinically, there was no tangible demonstration of specificity of wavelengths in the living body. Turrell [41] doubted that certain wavelengths had selective properties for certain cells. Speeding [27] felt that there was no special value in very short wavelengths (6 meters or less). Wolf [54] said that opinion tended more and more to the conclusion that no specific effect is produced by any particular wavelength. Furthermore, Kovács [71] averred that claims for specific effects by certain wavelengths had not found general corroboration. Chaffee [29] said that he was sure of his position in stating that no specific effect of any particular frequency had been proved to exist, nor was this to be expected, since the highest frequencies used were far too low to elicit any specific molecular activities.

While most of the foregoing observations have been based largely on conjecture, certain definite studies have been made by actual experiment. Thus Hill [72] in experiments on rats found that there were no differences in certain effects on experimental tumors whether the wavelengths employed were 3.4 meters, 6 meters or longer. Mortimer and Beard [73] tested by actual experiment fourteen short wave diathermy machines, of wavelengths between 6 and 25 meters, and they concluded that, for heating purposes, there appeared to be no advantage of any one wavelength over another. Coulter and Osborne [55] found no significant differences in heating effects of various wavelengths (9, 15, 16.4 and 24 meters) in pelvic heating experiments. Horowitz and his co-workers [63] used nine different machines with wavelengths varying from 6 to 18 meters in pelvic heating experiments and agreed with the results of Coulter and Osborne.[55] Coulter and Carter [74] reported that studies on the heating of live human muscle and fat revealed no significant heating differences with the use of various wavelengths (6, 12, 18 and 24 meters). Coulter and Osborne,[75] in additional studies on the heating of live human muscle and fat, with diverse wavelengths of short wave diathermy (6, 12, 18 and 24 meters) observed no noteworthy differences in the amount of heating. It is noted, however, that an editorial in the *Archives of Physical Therapy* expressed the opinion that the studies of Coulter and Osborne [75] indicated, despite their conclusions, that shorter wavelengths produced greater heating in the muscular than in the subcutaneous regions.

In my opinion these differences are so slight that I agree with the authors that they are negligible. My own clinical observations lead me to agree with Kobak [68] that an apparatus of high wattage output gives the best clinical results; however, I have seen no particular advantage in the use of the shorter wavelengths. The consensus (particularly of those who have performed careful experiments) would seem to be that the effect of various wavelengths between 3 and 30 meters is approximately the same.

BACTERIOLOGIC EFFECTS

Certain specific actions on bacteria and their toxins, both in vitro and in vivo, have been claimed. Szymanowski and Hicks [76] performed experiments on the effect of short waves on bacterial toxins. They mentioned that the effects might be due to "a specific local heating of the toxic molecular complex" but concluded that "ultra high-frequency radiation under the conditions described . . . is capable of producing definite attenuation of the three major bacterial toxins, diphtheria, tetanus and botulinus, in raw broth filtrates. This effect is obtained without the development in the toxin of temperatures that would themselves affect the potency of the toxin." In later studies, however, Hicks and Szymanowski [77] changed their opinion and stated after further experimentation that "the results tend to establish that ultra high frequency radiation, at least under many conditions, is biologically active only through the heat induced" and that there was "no evidence, so far, to show that there is any factor of significance in exposure to high frequency fields except that of heat."

Schliephake's [64] claim of having killed staphylococci at varying speeds with different wavelengths has been mentioned, as has Liebesny's [65] claim for a specific action of a 4 meter wavelength in actinomycosis. Compere [78] mentioned that short wave diathermy had been claimed to have a specific germicidal action. Haase and Schliephake [79] observed a more rapid lethal action on staphylococci and tubercle bacilli exposed to ultra short waves as compared with controls heated in water baths to the same temperatures. Hasché and Leunig,[80] however, exposed cultures of staphylococci and streptococci in distilled water, saline solution,

67. These writers have recently informed me that these data were "taken from a tabulation which appeared in 'Grundriss der Kurzwellentherapie' by Holzer and Weissenberg." They believe that in the light of present knowledge the data are rather questionable "since it has subsequently been shown (Oostvald and Rajewsky) that measurements made on fresh tissue at body temperature show large deviations from the previously accepted value." Bierman and Schwarzschild believed that heating was "more uniform" with short wave diathermy than with conventional diathermy, and in the recent communication they stated that they did not wish to be classified as "selective heating enthusiasts."

bouillon and milk and on agar-plates, to ultra short waves at different frequencies and intensities for periods up to eight and a half hours and they observed no inhibitory or destructive effect on the bacteria. Eidinow [22] said that it was untrue that short wave diathermy had any specific action on bacteria. He had made previous studies [43] in which sterile gauze, soaked in a broth emulsion of various organisms, was inserted under the skin of normal rats, which were then exposed to ultra short waves of 4.5 and 3.4 meter wavelengths. Eidinow was unable to demonstrate any bactericidal action whatever with these wavelengths, provided the tissues were effectively cooled. He felt that his work confirmed the observations of Christie and Loomis.[13] Mortimer and Osborne [56] believed that claims for specific bactericidal action of high frequency currents might be more rationally explained on the basis of "point heating" which raised the temperature of the micro-organisms above their thermal death point without a corresponding elevation in the temperature of the medium. They believed that it remained to be proved whether such test tube results could be obtained in the case of infections in the human body.

Ecker and O'Neal [81] attributed the effect on Bacillus typhosus agglutinin and complement, in experimental studies on animals exposed to ultra high frequency currents, entirely to the hyperpyrexia which was produced.

Schmidt [42] observed that there is too great a tendency to look for specific effects, such as on bacteria, for example, the fact being ignored that increased circulation may have a beneficial effect.

It would seem to be the consensus that neither in vitro nor in vivo are there specific bactericidal effects other than those attributable to heat.

PHYSIOLOGIC EFFECTS

It is of course generally accepted that short wave diathermy produces certain physiologic effects which are due to the local or systemic heating which may be produced, but a considerable controversy has arisen as to whether it produces specific effects other than heating.

With regard to the physiologic effects due to heat, Knudson and Schaible [82] concluded that daily systemic heating of rats to 40.5 C. with short wave diathermy did not retard their growth, appreciably affect their reproductive organs, or produce any pathologic lesions. In another experimental study on dogs, Knudson and Schaible [83] found after long elevations of temperature that no physiologic changes were produced other than those attributable to the fever. Bierman [11] said that the effect of the application of radiothermy could be explained on the basis of heat production. Boak and her co-workers [84] concluded that repeated elevation by short wave diathermy of the bodily temperature of rabbits failed to injure their growth or to interfere with mating, fertilization or the development of young in utero. Heinle and Phelps [85] reported that exposure to short radio waves produced no effect on the elasticity of aortic rings, and in another study they [86] concluded that radiothermy applied to perfused cats' hearts did not modify the natural tendency toward an increasingly hypodynamic state. Eidinow [43] concluded that the action of ultra short waves was to produce coagulative necrosis and extreme vasodilatation, which was similar to the effect produced by conventional diathermy. There is practically no confirmation of the claims of Weissenberg [87] that his so-called low intensity treatments produce definite physiologic effects,[88] nor is there any reason to believe that treatments of five minutes or less, as advocated by Stiebock,[89] have any marked action other than a psychic one.[22]

Schliephake [90] claimed that, when short wave therapy was used, one was not dealing with heating effects in the ordinary sense, as was still being asserted by some authors, but with a heat which often deviated from that of "thermotherapy and diathermy." No concrete proof of these deviations, however, has been forthcoming. Kobak [91] said that, although first interpreted as possessing occult biologic properties characterized as specific in nature, increasing experience has proved that the primary action of short waves was essentially that of heat due to displacement and conduction phenomena. Kobak apparently does not agree with Schliephake's claim that there are "specific effects on colloids," and rightly so since this claim has been fairly well refuted.

The claims of Schliephake, Reiter and a few others regarding specific effects other than heating are as follows:

Schliephake [92] believed that, in human beings who remained for a long time in the field, there were specific disturbances of the nervous system such as a "desire to sleep," a "high degree of enervation and prostration," "intensive headaches" and "digestive disturbances." He further believed [33] that the dividing membranes between the single cells and colloids were "in some way influenced" by short waves and said that this was "a definite effect only produced by the short waves and quite independent of heat." Later, he [93] contended that there was "point heating in colloidally dispersed substances in the condenser field." Reiter [94] asserted that a 3.4 meter wavelength had specific destructive effects on Jensen rat sarcoma in vivo. He [66] claimed also one "obviously specific action" of ultra short waves; namely, "an inflammatory effect." Reiter [60] believed, in addition, that ultra short waves showed a great number of biologic and therapeutic effects which could "not be looked upon as being heat effects alone." Compere [78] mentioned an "analgesic effect" and a "trophic action." Wilson [37] claimed a "peculiar effectiveness" in infections belonging "only to the ultra short waves from 6 to 3 meters." Jellinek,[95] asserted that new-born mice, placed in a weak, short wave field, seemed instantaneously paralyzed, indicating an effect other than heating.

Bauwens [96] said that short waves primarily made "tissues react against antigens" and secondarily caused local pyrexia. Weissenberg [25] said that there were "certain specific electrical effects" which had "a sedative influence in a pathological hypertonus of the autonomic nervous system."

Pätzold and Bierman were noncommittal concerning specific effects other than heating. Pätzold [59] said that the investigations concerning so-called specific effects were too much in flux to necessitate consideration at this early date. Bierman [97] believed that the question was still "a moot one."

Because of the claims for specific effects, the British Empire Cancer Campaign became interested, and Canti,[98] honorary secretary to the scientific committees for this campaign, observed: "Effects are claimed in a vast number of diseases . . . if this be true it would seem that a new and important physical agent is at our disposal." He then announced that the campaign had decided to enable Reiter to continue the investigations which led him to claim to have

V 11
1938

obtained "beneficial effects on both carcinoma and sarcoma in animals." Canti further announced that the campaign had instituted a separate investigation by Professor Curtis and Dr. Dickens.

It is interesting to note that the last named seasoned investigators presented the most definite refutation of the claims of both Reiter and Schliephake. After extensive investigations, Curtis, Dickens and Evans [99] questioned any "specific" actions of short waves which were not primarily thermal in action. They said "So far as is known at present from physical and chemical evidence, radiation of these wavelengths (3-15 meters) is not directly convertible into atomic or molecular energy." They traced to their sources the various references of those claiming specific actions and attempted, where possible, to repeat the experiments in question. In checking Reiter's [94] studies, they found that he had taken inadequate precautions against heating; that is, "in order to keep tissue contained in a suitable vessel at 40 C. it had to be immersed in a bath containing liquid paraffin at 6 C. Under these conditions no effect on metabolism was observed when the specimen was subjected to intense irradiation on a wavelength of 3.4 m." They were unable to confirm the claims of Schliephake and Compere that short waves produced lowering of surface tension in certain colloidal solutions, including blood and serum. They found that the stalagmometric method of measurement of surface tension used by Schliephake and Compere was "entirely unsuitable." Using the more accurate and convenient torsion balance method, they were "unable to find any effect whatever on the surface tension of serum, although an effect of the magnitude reported by Schliephake would have been readily detected." They concluded: "The variations of surface tension in the short wave field has been referred to in the literature as the 'Schliephake effect' but, in our opinion, proof of its existence is entirely lacking."

Furthermore, Curtis and his co-workers refuted the work of Schliephake and Recknagel which claimed changes in the viscosity and stability of colloids other than those caused by a rise of temperature. They said that only sixteen lines were devoted to a description of these fundamental phenomena in Schliephake's book and that in reply to their request for fuller information it was learned that this "could not be given 'on personal grounds.'" They called attention to the fact that Schliephake failed to mention in his book that Hicks and Szymanowski,[77] six months after their first paper was published, had withdrawn their earlier results on toxins [76] (used by Schliephake in corroborating his own work) and had reported that [77] "repeating the work of Schliephake and Haase on staphylococci they were unable to establish any effect of the high frequency field." Curtis and his assistants also tried to duplicate Holzer and Weissenberg's [20] "specific actions," notably decolorization of the dye pinacyanol in a short wave field, "but without success," and said that in a personal communication Dr. Holzer had stated that he had "since been unable to reproduce the effect." Furthermore, they could not verify Esau's observation, quoted by Pflomm, that turpentine oil could be hardened by exposure to a short wave field, and they could not confirm the "mysterious effects on operators of short wave appliances reported by both Holzer and Schliephake." They concluded that, if specific effects other than heating exist, "it should be possible for the discoverers to describe at least one clear cut experiment which could be repeated by other workers. In the absence of such evidence we consider that the great mass of inconclusive observations which has been presented is a very insecure foundation for the rapidly growing belief in specific short wave therapy."

Other studies by Dickens and his co-workers [100] caused them to conclude that "the effects on metabolism described by Reiter were really due to heat and not to a 'specific action.'" Hill [72] said that there was no effect from short waves other than heat. Hill and Taylor [101] studied the behavior of a frog heart, cilia and nerve-muscle preparation exposed to a 3.4 meter wavelength and concluded it was exactly the same as when merely heated in Ringer's solution and that the biologic action of short waves was therefore due to heat. Taylor [102] was unable to repeat Reiter's results successfully.

Jacobsen and Hosoi [103] concluded that their own studies and those of Knudson and Schaible [104] revealed the usual picture of hyperthermia and that the effects were not due to any factor other than heat.

Wetzel and Kiesselbach [105] studied the effect of 12 and 8 meter wavelengths on tadpoles kept cool by circulating water and observed no differences between treated and control tadpoles.

Mortimer and Osborne [56] decided that the burden of proof still lay on those who claimed any biologic action of short wave currents other than heat. Coulter and Osborne [106] came to the conclusion that heat alone was responsible for the therapeutic effects produced by short wave generators; Tenney [107] concluded that general exposures to short radio waves produced simply "a form of fever"; Halphen and Auclair [9] believed the properties attributed to short waves had been explained as being "due solely to the production of heat"; Gale [108] said that the effects of short wave therapy must "be assumed to be due to heat effects"; Kovács [71] said that the essential effect of short wave diathermy is heating and nothing else; Wolf [54] concluded that a specific action did not exist, that short waves exert their influence by the production of heat only, and finally the Council on Physical Therapy [57] concluded that there were no demonstrable specific biologic actions and that, to date, the effects produced could be explained only on the basis of the generation of heat.

My own clinical observations have never revealed any of the effects on the nervous system claimed by Schliephake, and exposure of one patient's hand to a 6 meter wavelength for eight hours daily for five days revealed none of the specific inflammatory reactions claimed by Reiter. Repeated, long fever treatments by many workers have failed to reveal any such effects. Jellinek's [109] claim that his experiment speaks "for the absence of heating" is controversial, since he has not explained his observation on any grounds.

The consensus seems quite definitely to be that, in the light of present observations, no specific physiologic effects other than those attributable to heating have been proved. Nevertheless the remote possibility of the existence of such effects cannot yet be denied.

DISADVANTAGES

The two commonly mentioned disadvantages of short wave diathermy, as compared with other methods of applying heat, are the danger of burns and the difficulty of measuring dosage.

Burns.—Turrell [110] averred that skin burns might occur from short wave therapy; in fact, he felt that far more care was required to avoid them than with

conventional diathermy. Wolf,[111] on the other hand, thought burns of the skin less common than with conventional diathermy. Although I[1] previously reported that burns did occur with short wave diathermy and that, in the absence of actual burns, burning sensations were more common than with ordinary diathermy, I nevertheless agree with Wolf that actual burns are less common with short wave than with conventional diathermy. Kling[112] said that the assumption that the use of short wave therapy precluded burns and therefore simplified the technic was a dangerous fallacy. He reported six cases of second or third degree burns in which he said[113] healing took place with firm normal scars. Kerr-Russell[114] had seen "two cases of burns" from short wave diathermy. Speeding[27] mentioned that occasionally an erythema or even blister formation would take place during short wave treatments. Schliephake[5] however, contended that in fifty thousand treatments during the course of six years he had seen burns only twice, and that these were insignificant and healed spontaneously within a few days. Egan[115] reported that burns do occur if too strong dosage is used or if perspiration is allowed to remain on the skin; he believed that they were a minor factor in treatment. Kovács[71] thought that because less heating effect on the skin occurred than with conventional diathermy there was, generally speaking, less danger of burns in short wave diathermy. The Council on Physical Therapy[37] reported that burns might occur with any method of applying short wave diathermy.

Another disadvantage which I have previously mentioned[1] is that cords or electrodes may burn, melt or char and that metallic furniture (bed springs particularly) may be unduly heated in the short wave diathermy field and sheets or other coverings may become ignited.

The consensus seems to be that, although burns may undoubtedly occur from short wave diathermy, they are less likely to occur than in ordinary diathermy treatments.

Dosage.—With regard to the difficulty in measuring dosage, Kovács[21] said that the crude method of measuring it was the greatest present drawback of short wave therapy. Schliephake[116] stated that methods of measuring dosage were so complicated that they were useless in medical practice. Although for several years physicians have expressed the hope that an accurate method of measuring dosage might be perfected,[1] to date no method of measurement other than through the patient's own sensations has been developed.

ADVANTAGES

Certain advantages are claimed, as follows: more uniform or homogeneous heating than with other thermal methods (Bierman[117]); more intense local heat, which is less hazardous (Davis[32]); deeper penetration and greater facility of application (Hollender[44]); the fact that only the middle, more or less straight-lined, part of the field might be used, producing an almost homogeneous heating, the fact that irregularly formed bodily surfaces (open wounds and so on) might be treated with effective doses (Pätzold[30]); possibility of introducing air spacing, so that only the axial portion of the field was used in therapy (Wilson[35]); greater efficacy of short wave treatments than of conventional diathermy in heating deeply situated parts in the thorax or abdomen (Cumberbatch[36]), and production of a deeper heating effect, and avoidance of high field concentration around the electrodes with short wave diathermy (Taylor[26]). I have been particularly impressed with the facility (not the simplicity) of application of short wave diathermy.

The consensus would seem to be that short wave diathermy produces more homogeneous, deeper heating of bodily tissues than other thermal methods, and that there is greater facility of application than with conventional diathermy.

THE USE OF SHORT WAVE DIATHERMY IN THE TREATMENT OF SUPPURATIVE PROCESSES

Out of the hodgepodge of poor presentations, consisting of many small series of uncontrolled cases, one claim has been constantly presented; that is, that short wave diathermy is particularly indicated in the treatment of suppurative processes.

Kobak[68] recently said that scientifically trained men allowed their first successful laboratory experiments "to overpower their conservative training and critical judgment" and that studies on short wave diathermy "must be presented in that objective and critical manner which recognizes verities and challenges errors." In no phase of the past studies on short wave diathermy has this "critical judgment" seemed more lacking and "objective" proof less evident than in the observations on its use in the treatment of suppurative processes. So far as can be ascertained, not one of the men who so enthusiastically advocated short wave diathermy for suppurative and infectious lesions has presented any systematic, controlled or comparative studies to prove his contentions. No consideration seems to have been given the fact that most superficial suppurative processes (owing to natural bodily mechanisms) go on to prompt regression without any treatment. Mere listing of claims for large numbers of successes without critical proof of these successes is unconvincing.

Schliephake[118] has been one of those who, while repeatedly having claimed remarkable successes in treating suppurations, has presented practically no controlled studies. Thus, starting with claims for "extraordinarily quick cure of suppuration" in "about a hundred cases"[119] (in 1931), he progressed to the point of claiming (in 1936) to have cured "hundreds of furuncles" in "an average of four and a half days" and large carbuncles in from "ten to fourteen days." He also stated: "I have treated forty patients with severe pleural empyema, lung abscesses and suppurative pneumonia with and without gangrene—all of these patients have been cured." He stated that "a furuncle heals occasionally also by hot compresses, but in the short wave field it becomes cured in a much shorter time." (He presented no comparative studies to prove this contention.)

Wilson[27] also claimed a peculiar effectiveness of short waves in the treatment of infections but presented no comparative studies. Wolf[111] concluded that short waves have a marked influence on acute and subacute inflammatory processes, but he likewise presented no confirming data. Eidinow,[43] although he found no specific action of short waves on bacteria or tissue cells, suggested that the deeper heating might explain why these waves were "of benefit in acute and chronic pyogenic infections." Kobak,[5] formerly expressed the opinion that short wave diathermy had "particularly demonstrated its therapeutic value in pyogenic infections." Among those who have reported a few uncon-

trolled studies which led them to believe that short wave diathermy was effective in suppurative lesions may be mentioned Taylor,[120] Barry [121] and Schmidt.[42] Kling [104] reviewed the work of twelve authors, and in 695 cases of "infectious conditions" cure or improvement was reported in 80 per cent. (Again no controlled studies were reported, and one wonders what percentage would have improved without treatment.)

The most convincing claims concerning the value of short waves in the treatment of suppurative processes came from Egan,[122] who gave 7,700 treatments to 1,030 patients with pyogenic infections in various bodily areas and concluded that it was of "distinct value in localizing infectious lesions." It has long been known that heat externally applied has these effects and, unfortunately, Egan, despite the excellence of his presentation, also has failed to make any definite comparative studies. Egan [115] mentioned that "either ultra short wave therapy is not diathermy or else the contraindications to diathermy are ill founded" and that he had been "unable to find the name of the scientist" who said that conventional diathermy was contraindicated in acute inflammatory lesions.

It is probable that this contraindication to conventional diathermy was originally formulated on a purely theoretical basis and that it has been handed down from textbook to textbook without any actual tests to prove the verity of the statement. Kobak [68] stated that it was "generally known that diathermy of the older type" was contraindicated "in the presence of suppuration." I contend that it has been merely accepted and is not "known." As a matter of fact, physicians have completely ignored this particular alleged contraindication and have treated acute pelvic inflammations with vaginal diathermy with considerable success—making this the single exception to the rule. Cumberbatch [36] has made a comparative study and has reached the expected conclusion. He wrote: "In the endeavor to ascertain whether diathermy is unsafe in the treatment of acute or purulent inflammation I have treated some cases . . . by the short wave method and others by diathermy. Sixty-two cases of carbuncle have been treated. In *both* forms of treatment there was rapid relief of pain; quick drainage followed and the sloughs separated leaving healthy granulating surfaces. The effects of each form of treatment were indistinguishable and equally quick." Although Cumberbatch's studies would seem to have reached the crux of the entire problem, they will, of course, need confirmation. Kovács [21] pointed out that forms of mild heating other than short wave diathermy "when applied efficiently produce similar resolving and sedative effects."

Hollender [44] said "We are led to assume from the reports of European workers that surgery is frequently obviated in acute infectious processes but such claims have not been borne out by the experience of workers in this country."

Schliephake's [90] claim that short wave diathermy was remarkably efficacious in the treatment of pulmonary infections, which he stated had been confirmed by Liebesny,[65] was not supported by Cumberbatch,[36] who stated that in one case of empyema with persistent discharging sinus "both diathermic and short wave treatment were unsuccessful." I also attempted to confirm Schliephake's claims and exactly duplicate his technic, as described, using the same type of apparatus and electrodes. Daily treatments for over a month elicited not the slightest change in this particular case. Further studies are undoubtedly necessary in order to confirm or refute Schliephake's claims. Nevertheless, whereas he stated that all his patients were "cured," at least two failures by other observers can now be noted.

The consensus would seem to be (at the present moment) that short wave diathermy is particularly indicated in the treatment of suppurative lesions; however, insufficient comparative studies have been presented to determine whether short wave diathermy is more effective than other simpler forms of mild heating.

SUMMARY AND CONCLUSIONS

Short wave diathermy has become the accepted term, at least in the United States, for treatment with short radio waves of wavelengths between 3 and 30 meters. Most observers prefer a vacuum tube apparatus of high wattage output for the production of such radiation, although spark gap apparatus has been used effectively by some workers. Devices of low energy output would seem to have no effect other than a psychologic one.

While there appears to be no great difference between the effects produced by conventional and short wave diathermy, short wave diathermy seems to produce deeper, more uniform heating and is more readily applied, although dosage control is more difficult than with conventional diathermy.

So far as competent investigators have been able to determine, there is no demonstrable selective thermal action in the living body. For various physical reasons, short wave diathermy should produce more uniform and deeper heat penetration than conventional diathermy; but for reasons which at present must be purely a matter of conjecture, many clinical observations have not confirmed this opinion.

The consensus (particularly of those who have performed careful experiments) would seem to be that the effect of various wavelengths between 3 and 30 meters is approximately the same. There are apparently no specific bactericidal effects other than those attributable to heat, either in vitro or in vivo. There is no reason to believe that treatments of five minutes or less have any marked action other than a psychic one.

In light of present observations, no specific physiologic effects other than those attributable to heating have been proved to exist.

Although burns may occur from short wave diathermy, they are less likely to be found than in conventional diathermy. Lack of a satisfactory method of determining dosage is a definite handicap in administering short wave diathermy.

The chief advantages claimed for short wave diathermy in comparison with other thermal measures are that its action is more homogeneous, there is deeper heating of bodily tissues and it affords greater facility of application. It is claimed that short wave diathermy is particularly indicated in the treatment of suppurative lesions; however, insufficient comparative studies have been presented to determine whether or not it is more effective than other simpler forms of mild heating.

The indications for the use of short wave diathermy should be considered, in light of present knowledge, to be the same as those for the use of conventional diathermy.[123] Further studies may prove that other indications do exist.

123. For list of indications see Coulter, J. S.: Medical Diathermy, J. A. M. A. **106**: 209-214 (Jan. 18) 1936.

110
938

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SATURDAY, APRIL 16, 1938

DR. JAMES H. MEANS ADDRESSES THE COLLEGE OF PHYSICIANS

In his presidential address to the American College of Physicians at its annual session in New York last week, Dr. James H. Means was reported by the New York *Times* to have said:

The behavior of the American Medical Association is political. It is partisan behavior. It champions a cause. At the present time the cause is something close to stand-patism.

Later in his address he said:

We hear a great deal about the sacrosanct doctor-patient relationship. No third party can be allowed to come between the two involved. This has been used as an argument against all attempts to improve the efficiency of medical service through group practice. When it is suggested that a disinterested outside person could with greater equity than the doctor determine what might be a proper fee for services rendered in any given case, there are storms of protest from the conservative wing of the profession. Yet a philosopher might recognize such an arrangement as an ideal one, and, as a matter of fact, it is actually working successfully in more than one place, to the satisfaction of both doctors and patients. . . . I submit that having a third party determine the size of, and even collect, the fee from the patient for the doctor is not only not an intrusion into the holy doctor-patient relationship but actually increases the likelihood of the patient's receiving from the doctor the best and wisest treatment the doctor is capable of giving.

The statement by Dr. Means was heralded by the New York *Times* in headlines on page 1 as a revolt against the American Medical Association. This aroused a storm of protest among the members of the American College of Physicians present at the session. More than 300 members signed a statement, of which the following is a quotation:

Unfortunately, a situation has arisen in which the impression has been given in the Public Press that the American College of Physicians is in revolt against the organized medical profession as represented by the American Medical Association.

Inasmuch as no such action has ever been taken by the American College of Physicians and inasmuch as there is reason to believe that the impression created does not correctly reflect the attitude of the membership of the American College of Physicians, we the undersigned fellows of the College respectfully petition the Board of Regents immediately take action to correct this impression publicly.

Dr. Means himself signed this document and issued a personal statement at the banquet on the night following in which he said:

I am not advocating a revolt, and nothing of that sort was mentioned in the speech which I made last night.

This statement was duly buried by the New York *Times* on page 11, following a scientific discussion dealing with the history of appendicitis. The Board of Regents of the College of Physicians unanimously adopted the following statement before its adjournment:

Unfortunately an impression has been created that the American College of Physicians is in revolt against the organized medical profession as represented by the American Medical Association. This does not correctly reflect the statement of Dr. James H. Means in his presidential address. Nor does the impression represent any position taken by the membership, since there has been no official consideration by the College of the questions involved.

This statement was duly buried by the New York *Times* on page 19 at the end of a consideration which it headed "Victims of Scurvy Found Among Rich." Altogether the incident may have a salutary effect on the medical profession in establishing with some certainty those to whom it must look for guidance in protecting its established standards and ideals.

DEATHS FROM ENSOL-REX CANCER TREATMENT AND FOOD AND DRUG LEGISLATION

Authorities representing both the Biologic Division of the National Institute of Health and the Food and Drug Administration of the Department of Agriculture are agreed that the deaths in Orlando, Fla., discussed in THE JOURNAL last week, were due to Rex, series 152, prepared by the Biochemical Research Foundation of the Franklin Institute of Philadelphia. A portion of this batch, bearing the date of March 7, showed the presence of tetanus toxin; the deaths were due to the preformed toxin developed in the course of manufacture of the product. The two government agencies absolved both the Hendry Connell Research Foundation in Canada and the Franklin Institute of Philadelphia from intentional guilt in the preparation of the serum. Neither Ensol nor Rex had been licensed for interstate sale but were sent broadcast without charge and with a view to obtaining experimental therapeutic evidence. According to statements in Orlando newspapers, an official spokesman for the Food and Drug Administration said:

There is no law to prohibit shipment of dangerous medicines, as demonstrated in the famed elixir case last fall. At that time we recommended that Congress pass laws to cover such situations, but to date our recommendations have not been acted upon.

Readers will recall the series of articles in THE JOURNAL concerning the Elixir of Sulfanilamide-Massengill episode, in which more than seventy-six persons died following the administration of the elixir. At that time THE JOURNAL said:

A physician is not compelled to follow the United States Pharmacopeia, the National Formulary or the Council on Pharmacy and Chemistry in the prescribing of drugs. He may, if he wishes, prescribe anything that he thinks may be of benefit

V 11
1938

for his patient. Indeed, the Council on Pharmacy and Chemistry encourages scientific experimentation with new remedies, provided these experiments are carried out with suitable controls and with adequate facilities for therapeutic investigation. In the usual conditions of practice, however, it is far safer—as this tragedy again emphasizes—to limit prescriptions of nonofficial products to those accepted by the Council on Pharmacy and Chemistry and to use them as described in New and Nonofficial Remedies.

Readers of THE JOURNAL will remember that at this very moment people in the United States are being offered other treatments for cancer involving injection into the human body of materials of unknown composition or otherwise uncontrolled and unestablished. The products developed by William Koch in Detroit, by Coffey and Humber in California, and more recently by Beaumont Cornell in Fort Wayne, Ind., are in this category. Perhaps the National Health Institute should concern itself, if possible, under the law, with the use and distribution of these materials. Experiments on animals with the so-called Cornell cure for cancer developed in Fort Wayne resulted in complete failure and the available clinical evidence is hardly worthy the name. As was predicted in discussing the Hendry Connell cancer treatment, the use of such methods will inevitably bring grief to those who are concerned with their employment.

How many additional deaths will be necessary before Congress gives the people of the United States real protection against hastily concocted, secret remedies? How many more human guinea pigs are to be sacrificed by exploiters of unestablished and virtually untested drugs, serums and cosmetics? For five years food and drug bills have been before one or the other branch of Congress. At each hearing, effective provisions for consumer protection in these bills have been deleted in the interest of exploiters. Bill after bill has been emasculated as it came to the Congress for consideration. In their care and concern for the health needs of the people, why do our legislators so persistently evade this issue?

OBITUARIES OF PHYSICIANS PUBLISHED IN 1937

The number of obituaries of physicians published in THE JOURNAL during 1937 was 3,398, including 3,277 of the United States, as compared with 3,475 in 1936, also 121 names of Canadian physicians. Three died in China, 2 each in India and Honduras and 1 each in Alaska, British West Indies, the Canal Zone, England, Puerto Rico and South America. The obituaries of 113 women physicians were published, as compared with 103 in 1936. The number of graduates of medical schools in the United States for the fiscal year ended June 30, 1937, was 5,377. Deducting the number of physicians whose obituaries were published, there was a net addition to the profession for the year of 2,100, not including physicians coming from abroad.

Ages.—The average age at death of those classified as of the United States was 65.4, as compared with 64.5 in 1936. Twenty-four physicians died between the ages of 25 and 29, fifty between 30 and 34, 112 between 85 and 89, forty-one between 90 and 95 and four between 95 and 99; two were more than 100. In two cases the age was not reported.

Causes of Death.—Heart disease was again the leading cause of death, as it has been for many years. Some contributory causes are included in THE JOURNAL'S tabulation, as they have been in former years. For example, when a report of the cause of death gave chronic nephritis and heart disease, it was published as such in THE JOURNAL and was recorded on the statistical charts under both diseases. Thus heart disease was reported as a cause of death in 1,360 cases. Endocarditis or myocarditis was specified in 339 cases, coronary thrombosis in 289, angina pectoris in 98 and pericarditis in 2. Other diseases of the heart caused 632 deaths. Pneumonia was the second most frequent cause, with 392 deaths, of which 102 were specified as bronchopneumonia. Arteriosclerosis was the third most frequent cause, with 382 deaths; other diseases of the arteries caused 4. Fourth on the list was cerebral hemorrhage, with 353 deaths; 20 additional deaths were reported as due to paralysis. Of 311 deaths reported as due to cancer, the stomach and liver were reported affected in 59 cases, the intestine in 53, the prostate in 42, the female genital organs in 2 and the skin in 1; in 154 cases the part affected was not specified. Nephritis was reported as the cause of 172 deaths. The number of cases in which hypertension was reported was 91, embolism and thrombosis exclusive of coronary thrombosis 83, diabetes mellitus 73, uremia 63, other diseases of the genito-urinary system 74, diseases of the prostate other than cancer 58, tuberculosis 56, influenza 43, cirrhosis of the liver 35, senility 31, septicemia 21, appendicitis and ulcer of the stomach and duodenum 19 each, other diseases of the digestive system 15, intestinal obstruction 17, peritonitis 16, leukemia 15, bronchitis, meningitis and brain tumor 14 each, other tumors 10, paralysis agitans and diseases of the liver 13 each, aneurysm, biliary calculi and cholecystitis 7 each, arthritis, asthma, hernia and Hodgkin's disease 6 each, cellulitis, encephalitis, erysipelas and pernicious anemia 5 each, cerebral sclerosis, otitis media, pulmonary infarct and streptococcic infection 4 each, Addison's disease, carbuncle, empyema, hyperthyroidism, malaria, multiple sclerosis, phlebitis, sinusitis, streptococcic sore throat and Streptococcus viridans infections 3 each, agranulocytic angina, amebic dysentery, intestinal diverticulitis, Ludwig's angina, ileus, pellagra, scarlet fever and thromboangiitis obliterans 2 each. Other diseases reported as causing one death each were acromegaly, aplastic anemia, bacillary dysentery, brain abscess, dementia paralytica, diphtheria, diverticulum of the esophagus, ectopic pregnancy, encephalomalacia, hemochromatosis, hiccup, intestinal rupture, Kümmel's disease, lipoid dystrophy, mediastinitis, multiple myeloma, myasthenia gravis, osteoarthritis, osteitis deformans,

parotitis, periarteritis nodosa, poliomyelitis, polyneuritis, progressive muscular atrophy, staphylococcic infection, substernal goiter, syringomyelia, thrombocytopenic purpura, typhoid fever, typhus, pyloric ulcer and undulant fever.

Accidental Deaths.—One hundred and fifty-one physicians died as the result of accidents in 1937, compared with 182 in the previous year. Automobile accidents accounted for 71 deaths, falls 37, drowning 5, shooting, airplane accidents, carbon monoxide poisoning from automobiles and overdoses of medicine 4 each, x-ray burns and electricity 2 each, burns, explosion, gas, poison and street car accident 1 each. In twelve cases unexplained fractures were given as causes of death. One physician died of injuries and exposure after his car stalled in a snowstorm while en route to attend a patient, one of strangulation by a lamp cord.

Suicides and Homicides.—Suicide was the cause of 52 deaths published in 1937. Bullet wounds accounted for 25 of these deaths, poison 10, hanging 5, incised wounds 4, gas and overdoses of morphine 2 each, chloroform and jumping 1 each. In two cases the method was not reported; in addition twelve deaths from the following causes could not be classified because of insufficient information: overdose of morphine 4, barbital poisoning 3, cyanide poisoning, carbon monoxide poisoning, illuminating gas, shooting and strychnine poisoning 1 each. There were 12 homicides.

Civil Positions.—Among the decedents were 219 physicians who were or had been teachers in medical schools, 434 who had served in the World War, 17 veterans of the Civil War and 51 veterans of the Spanish-American War. One hundred and seventy-one were or had been health officers, 124 members of boards of education, 81 members of boards of health and 15 members of state boards of medical examiners. There were 52 who were or had been coroners, 38 members of state legislatures, 36 mayors, 32 pharmacists, 31 bank presidents, 24 members of city councils, 21 authors, 20 editors, 13 missionaries, 9 dentists, 8 police surgeons, 7 clergymen, 5 postmasters, 5 lawyers, 3 judges, 2 congressmen, 2 governors, 1 lieutenant governor and 1 justice of the peace. There were 13 members of the U. S. Army Medical Corps, 9 of the U. S. Navy Medical Corps, 16 of the U. S. Public Health Service, 4 of the Veterans' Administration and 7 of the Indian Medical Service.

Association Officers.—Among those who died who were or had been officers of the American Medical Association were Dr. George H. Simmons, Editor and General Manager Emeritus, 2 vice presidents, ten section officers and 3 members of councils. Thirty-one members or former members of the House of Delegates died during the year. There were also 29 presidents or former presidents of state medical associations, 2 presidents-elect and 5 secretaries.

Current Comment

"LIBERTY" AND MEDICINE

For some weeks *Liberty*, published by Macfadden Publications, has been printing what purports to be an exposé of medical practice by one Dr. "George B. Raymond." The story is called "Doctors Don't Tell." An editorial note intimates that this is a true story and that its purpose is to expose evils that are hidden by medical ethics. From all over the country have come protests from both nonmedical readers and physicians against the obvious lack of dependability in this material. If the statements are honest and susceptible of verification, the author should not hesitate to attach his name. Evidence now available indicates however, that the prefix "Dr." before the author's name should also have been in quotation marks. A telegram was sent to Macfadden Publications asking the editor to confirm the fact that the articles had been prepared by an individual who had failed to receive a medical degree and who had admitted deceit in the securing of a license. Apparently Macfadden Publications does not wish to answer this question. These statements indicate how little creditability can be given to or dependability placed on this alleged exposé of medical ethics in *Liberty*.

NATIONAL CANCER SURVEY

The United States Public Health Service announced [1] in September 1937 the appointment of a National Advisory Council to the National Cancer Institute. This council consists of six scientists, of whom three are doctors of medicine. At that time the erection of the cancer institute on a site in Bethesda, Md., was announced.[2] The institute is to be part of the National Institute of Health. By provisions of a House joint resolution of the Seventy-Fifth Congress, third session, the President of the United States proclaimed April of each year as "Cancer Control Month" and invited governors of the several states, territories and possessions to issue like proclamations.[3] The Woman's Field Army of the American Society for the Control of Cancer immediately became interested. As a result, cancer is the subject of much publicity during this month. The Minnesota house of representatives has urged that the Postmaster General permit a cancer slogan "Early Cancer is Curable" to be used on postal meters which are used by large organizations in lieu of affixed postal stamps.[4] In Maryland,[5] cancer activities are sponsored by the cancer committee of the Medical and Chirurgical Faculty—the state medical society. In Passaic County, N. J.,[6] the county medical society has taken the leadership and so also has the medical society in Allegheny

1. Government Services, J. A. M. A. **109:** 1287 (Oct. 16) 1937.
2. Government Services, J. A. M. A. **109:** 883 (Sept. 11) 1937.
3. Press release entitled "Cancer Control Month, By the President of the United States of America, A Proclamation," issued by the Woman's Field Army of the American Society for the Control of Cancer, April 1938.
4. Cancer Control Slogans Urged for Postal Meters, Bull. Am. Soc. Control of Cancer, July 1937, p. 9.
5. Cancer Control Month, Monthly Bull. Maryland State Department of Health, April 1938, p. 9.
6. Passaic County's Cancer Week, Bull. Am. Soc. Control of Cancer, February 1938, p. 8.

County (Pittsburgh).[7] The United States Public Health Service, meantime, is conducting a survey by questionnaire, asking physicans to report information about cancer patients for whom they have cared during 1937. This information can be reported so that its reporting will not violate the confidential character of physician-patient relationships. Since cancer is not a reportable disease, cooperation from physicians in this survey will be purely voluntary. It may entail considerable labor and some inconvenience, but it is desirable and in the public interest. The first step toward conquest of any disease is a complete knowledge of its prevalence.

PLAGUE TRANSMISSION

In the thirty years since the Indian Plague Commission demonstrated that fleas act as the transmitting agents of bubonic plague, the flea has been the only insect considered of importance in the natural dissemination of this disease. Observations of the course of several outbreaks have demonstrated [1] that the intensity of epidemics of plague is regulated not by the total number of fleas on the rats of the communities but rather by the species of fleas with which the rats are infested. In fact, as far as is known, plague epidemics have never occurred in communities where Nosopsyllus fasciatus has existed alone to the exclusion of Xenopsylla cheopis. Experimental investigations indicate that the latter flea is much more susceptible to plague infection than any of the other fleas tested. Sixty-six per cent of cheopis fleas fed on infected guinea pigs were found to harbor the plague bacillus in comparison with only 21 per cent of all the other fleas similarly exposed. The cheopis fleas when successfully infected had an average length of life of only sixteen days, and only one reached a maximum of thirty-six days. From the information now available regarding plague-infected fleas, it is possible to explain tentatively the reasons why plague outbreaks in different parts of the world have varied so much in character. In the warm localities where cheopis constitutes the only rat flea found, plague epizootics have frequently subsided quickly in accordance with expectation based on the experimental observation that plague infected cheopis fleas do not survive long and therefore do not remain infective for long periods. As the bites of these fleas may readily transmit plague, however, the human incidence of infection will usually be high where this variety is abundant. In the colder climates, where the fasciatus is present in a relatively high proportion, plague outbreaks may be prolonged but are generally associated with relatively few human cases. In conclusion, Eskey [1] points out that those fleas which are most susceptible to plague infection of the gastrointestinal tract and to the bacterial obstruction of the esophagus are the most dangerous vectors. As long as the flow of blood to the stomach is not blocked, infected fleas may bite on their hosts without danger of transmitting the disease, although some danger of infection exists from the virulent organisms present in the feces of all infected fleas.

7. The United States Public Health Service Cancer Survey, Pittsburgh M. Bull., March 26, 1938.

1. Eskey, C. R.: Recent Developments in Our Knowledge of Plague Transmission, Pub. Health Rep. 53: 49 (Jan. 14) 1938.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARIZONA

State Medical Meeting at Tucson. — The forty-seventh annual meeting of the Arizona State Medical Association will be held in Tucson April 21-23 with headquarters at the Santa Rita Hotel and under the presidency of Dr. Harold W. Rice, Bisbee. Guest speakers who will address the scientific sessions are:

Dr. Franklin G. Ebaugh, Denver, Frequent Psychiatric Complications in General Practice.
Dr. John H. Woolsey, Woodland, Calif., Regional Ileitis.
Dr. Albert S. Crawford, Detroit, Craniocerebral Injuries.
Dr. Jay C. Davis, Minneapolis, Effect of Drugs on Coronary Circulation.
Dr. Leslie M. Smith, El Paso, Texas, Lesions of the Oral Cavity.
Dr. Stuart W. Harrington, Rochester, Minn., Diaphragmatic Hernia.

Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will address a public meeting at the University of Arizona auditorium Thursday evening on "Medicine and the Changing Social Order." He will also address the house of delegates at an open meeting Friday afternoon on "Medicine and the National Policy," and the Woman's Auxiliary Thursday afternoon. The other guest speakers will speak at round table luncheons Thursday and Friday, and there will be clinics Friday and Saturday mornings at the Pima County, Comstock, Southern Methodist and St. Mary's hospitals, the Southern Pacific Sanatorium, the Desert Sanitarium and the U. S. Veterans' Facility. The annual banquet and dance will be Friday evening at the Santa Rita. Saturday afternoon a golf tournament and a fishing trip to Guaymas have been arranged.

CALIFORNIA

Lectures for the Public.—Stanford University School of Medicine, San Francisco, opened its "popular medical lectures" April 1 with a talk by Dr. Walter W. Boardman on "Conditions of the Mouth in Relation to Disease." Others in the series include:

Dr. Donald E. King, April 22, Backache: Causes and Treatments.
Dr. William J. Kerr, May 6, Forty, Fat and Florid and Heading for Circulatory Failure.
Dr. Dwight L. Wilbur, May 27, Vitamin Facts and Fallacies.

Changes Among Health Officers. — Dr. Alphonso O. Skancky has been appointed health officer of San Bruno to succeed the late Dr. Frank Holmes Smith. Dr. Martha E. D. Rinehart-Allen is the new health officer of Fairfax, succeeding Dr. Bernard J. Conroy. The city of Indio has transferred its public health administration to the Riverside County Health Department. The city of Santa Cruz has transferred its administration of public health affairs to the Santa Cruz County Health Department.

Another Death from Rabies.—A laborer in Los Angeles died in the Los Angeles General Hospital March 12 from rabies, according to the *Weekly Bulletin* of the state department of health. He had been bitten on the finger about February 22 by a dog which he saw lying in the street, apparently dead. When he attempted to pick up the dog it bit him and ran away. No attention was paid to the bite until after the onset of the illness. The patient died within twenty-four hours after entering the hospital.

FLORIDA

Medical History of St. Augustine.—A survey of the medical history of St. Augustine is being made in conjunction with a survey of the history of the locality as a part of a plan to restore the city as the first permanent settlement in the United States, according to the *Journal of the Florida Medical Association*. The project is sponsored by the National Committee for the Preservation and Restoration of Historic St. Augustine, the chairman of which is John C. Merriam, president of the Carnegie Institution of Washington; it is being carried out in cooperation with the institution. A committee from the St. Johns County Medical Society is collaborating with the research unit in collecting and arranging data for the survey of the medical history. Members are Drs. Jacob John Spencer, chairman, Vernon A. Lockwood and Robert D. Harris Jr. Search is being made for data on the Indian concept of medicine at the time Menendez founded St.

Augustine, the effects on the health of the Indians of contact with the colonists, the medical methods and facilities of the colonists during the first Spanish occupation, the English occupation, the second Spanish occupation and the period which followed the purchase by the United States. The sites of early hospitals have been located and it seems that the first hospital built within the limits of what is now the United States was the hospital of Santa Barbara. This hospital was built by De Canzo, Spanish colonial governor of Florida, in about 1600. It is expected that one of these early hospitals will be included in the buildings selected for restoration, and it is planned to establish a medical museum in the restored hospital. Physicians interested are asked to communicate with Dr. Spencer, 32 Saragossa Street, St. Augustine.

GEORGIA

State Medical Meeting at Augusta, April 26-29.—The Medical Association of Georgia will hold its annual meeting at the Forest Hills Hotel, Augusta, April 26-29, under the presidency of Dr. George A. Traylor, Augusta. The Abner Wellborn Calhoun Lecture will be delivered Wednesday by Dr. George H. Semken, New York, on "The Problem of the Lump in the Breast." Dr. Irvin Abell, Louisville, Ky., President-Elect, American Medical Association, will also give an address Wednesday. The Richmond County Medical Society will be host and the speakers will include:

Dr. Richard Frank Slaughter Jr., Augusta, Relief of Causalgic-like Pain in the Isolated Extremity by Sympathectomy.
Dr. Trimble C. Johnson, Atlanta, Diagnostic Traps in Gastroenterology.
Dr. Cornelius F. Holton, Savannah, Use of Atabrine in Treatment and Control of Malaria Among a Group of Industrial and Agricultural Employees in Georgia.
Drs. Henry C. Frech Jr., and Perry P. Volpitto, both of Augusta, Amnesia in Labor: Comparing Pentobarbital and Hyoscine with Seconal and Hyoscine.
Dr. Benjamin T. Beasley, Atlanta, Altered Mechanics of the Female Peritoneal Supports.
Dr. Robert M. Harbin Jr., Rome, Clinical Observations of the Use of Sulfanilamide.
Dr. Stacy C. Howell, Atlanta, Would You Recognize a Case of Glaucoma?

A symposium on pneumonia will be held Wednesday afternoon, the speakers to be Drs. Joseph Dewey Gray and Morris C. Fulton, Augusta; Thomas L. Ross, Macon; Stewart R. Roberts, Atlanta, and Charles H. Richardson, Macon. Entertainment will include the annual dinner of the alumni of Emory and Georgia university schools of medicine, golf and the annual banquet Thursday evening, when Dr. Eugene E. Murphey, Augusta, will be toastmaster. The woman's auxiliary will meet in Augusta April 26-29.

ILLINOIS

Society News.—Dr. Karl D. Dietrich, Columbia, Mo., addressed the Adams County Medical Society, Quincy, March 14, on "Relation of Urology to Obscure Abdominal Symptoms."——At a joint meeting of the Sangamon County Medical Society and the Springfield Medical Association in Springfield, March 3, Dr. Bernard Fantus and Ralph Terry, Ph.D., Chicago, discussed "Progress in Therapeutics."——Dr. Walter C. Alvarez, Rochester, Minn., addressed the Springfield Medical Club, Springfield, March 17, on "Disorders of the Gastrointestinal Tract."

Chicago

Dr. Harris' Library Given to County Hospital.—The medical library of the late Dr. Malcolm L. Harris, President of the American Medical Association, 1928-1929, has been given to the library of Cook County Hospital by Mrs. Harris. The collection consists of about 600 volumes. Dr. Harris served his internship at the hospital and later was attending surgeon.

Society News.—At a meeting of the Chicago Society of Internal Medicine March 28, Dr. Sidney A. Portis, among others, spoke on "Chronic Bacillary Dysentery."——The Chicago Medical Society was addressed March 16 by Drs. Herman L. Kretschmer on "Importance and Significance of Pyuria in Children" and John L. Reichert, "Vaginitis in Childhood."

INDIANA

Military Training for Reserve Officers.—A course in medical military instruction will be given to all medical reserve officers in the fifth corps area and to members of the Indiana State Medical Association May 23-27, in accordance with a request made by army officers, newspapers report. The course will be held in connection with the annual graduate meeting in Indianapolis, sponsored by the state medical association and the Indiana University School of Medicine. The fifth corps area includes Indiana, Ohio, Kentucky and West Virginia.

KANSAS

Appointment of County Health Officers.—The following county health officers have recently been appointed:

Dr. Edwin R. Hill Jrr, Lyons, Rice County.
Dr. August A. Meyer, Alma, Wabaunsee County.
Dr. Orlin P. Wood, Marysville, Marshall County.
Dr. Alfred J. Horejsi, Ellsworth, Ellsworth County.
Dr. Benjamin Brunner, Wamego, Pottawatomie County.
Dr. Raymond W. Moore, Eureka, Greenwood County.
Dr. Frank A. Trump, Ottawa, Franklin County.
Dr. Franklin R. Croson, Clay Center, Clay County.
Dr. Benjamin L. Phillips, Paola, Miami County.
Dr. Leon W. Zimmerman, Liberal, Seward County.
Dr. Ivan B. Parker, Hill City, Graham County.

The following physicians have been reappointed as county health officers: Spencer B. Dykes, Esbon, Jewell County; Robert J. Lanning, Junction City, Geary County, and Donald A. Bitzer, Washington, Washington County.

Society News.—The Labette County Medical Society was addressed February 23 in Parsons by Drs. Winfred L. Post, Joplin, Mo., on "Foreign Bodies in the Air Passage and Therapy of the Lung Through the Bronchoscope" and Hugh D. McGaughey, Joplin, "X-Ray Radiation in Nonmalignant Conditions."——The Saline County Medical Society was addressed in Salina in February by Drs. Donald A. Anderson and Ernest E. Harvey, Salina, on "Treatment of Syphilis" and "Clinical Use of Protamine Zinc Insulin."——Dr. Edgar A. Pickens, Wichita, addressed the Ford County Medical Society in Dodge City February 11 on "Management of Prostatic Obstruction."——At a joint meeting of the Shawnee County medical and dental societies in Topeka, March 17, the speakers, all of Topeka, were Louis Fleisch, D.D.S., on "Interrelation of Preventive Medicine and Preventive Dentistry"; Dr. James G. Stewart, "Relationship Between Focal Infection and General Medicine"; C. N. Mertz, D.D.S., "Oral Infections in Relation to Systemic Infection," and Harold W. Powers, "Relationship Between Sinus Disease and the Teeth."

MARYLAND

Annual Session of Medical and Chirurgical Faculty.—The annual meeting of the Medical and Chirurgical Faculty of Maryland will be held at the Belvedere Hotel, Baltimore, April 27. The program will be made up of round table discussions in which the following, among others, will participate:

Dr. James G. Arnold Jr., The Value of Sulfanilamide in the Treatment of Various Types of Meningitis.
Dr. Harold R. Bohlman, Use of Sulfanilamide in Orthopedics.
Dr. Lloyd G. Lewis, Carcinoma of the Prostate.
Dr. Arthur M. Shipley, Acute and Chronic Pericarditis.
Dr. James Dawson Reeder, Fistula in Ano: Diagnosis and Treatment.
Dr. William Raymond McKenzie, Fractures Involving the Paranasal Sinuses.
Dr. Edgar B. Friedenwald, The Common Cold in Children.
Dr. Walter E. Dandy, Lesions of the Cranial Nerves.
Dr. Thomas S. Cullen, Uterine Hemorrhage and Its Cause.

MISSISSIPPI

State Medical Meeting at Jackson.—The seventy-first annual session of the Mississippi State Medical Association will be held at the Robert E. Lee Hotel, Jackson, April 19-21, under the presidency of Dr. William L. Little, Wesson. Guest speakers will include:

Dr. Troy P. Bagwell, Knoxville, Tenn., Management of Anterior Poliomyelitis.
Dr. Newdigate M. Owensby, Atlanta, Ga., The More Recent Concepts and the Management of Mental Maladies.
Dr. Edwin Gurney Clark, Nashville, New and Standard Practices in the Management of Syphilis.
Dr. Raphael E. Semmes, Memphis, Eye, Ear, Nose and Throat Evidence of Intracranial Disease.
Dr. Ralph O. Rychener, Memphis, Lacrimal Apparatus.
Dr. Francis E. LeJeune, New Orleans, Hoarseness.
Dr. Philip W. Brown, Rochester, Minn., Certain Deficiency Disorders in Intestinal Disease.
Dr. Leon J. Menville, New Orleans, Carcinoma of the Cervix.
Dr. Maxwell E. Lapham, New Orleans, Management of Breech Presentation.
Dr. Isidore Cohn, New Orleans, The Making of a Surgeon.

Dr. James S. McLester, Birmingham, Ala., Past President of the American Medical Association, will deliver the Ewing Fox Howard Oration on "Causes and Effects of Hypertension." The Mississippi State Pediatric Society will meet Monday April 18 with the following speakers: Drs. Stanley Gibson, Chicago, "Management of Pneumonia in Childhood"; M. Hines Roberts, Atlanta, Ga., "An Evaluation of Our Methods of Protection Against Certain of the Infectious Diseases"; Felix J. Underwood, Jackson, "The Immunization Problem in Mississippi," and Horton R. Casparis, Nashville, "The Endocrines as Related to Children." Dr. Gibson will also address the annual banquet on "The Diagnosis of Heart Disease in Childhood." The Mississippi State Hospital Association will meet April 18.

V 11
1938

MONTANA

Graduate Lectures.—Graduate meetings will be held in Miles City, April 25-26; Livingston, April 27-28, and Missoula, April 30-May 1, under the auspices of the Medical Association of Montana. The speakers will be Drs. Mynie G. Peterman, director, department of pediatrics, Marquette University School of Medicine, Milwaukee; Morris Edward Davis, associate professor of obstetrics and gynecology, University of Chicago School of Medicine, and Francis W. Lynch, St. Paul. Dr. Davis will speak on "The Prophylaxis and Treatment of Puerperal Infection," "Medical Complications of Pregnancy" and "Common Obstetric Operations." A public meeting will be held at Missoula, April 30, on syphilis.

NEBRASKA

State Medical Meeting at Lincoln.—The annual assembly of the Nebraska State Medical Association will be held in Lincoln April 26-28 at the Hotel Cornhusker. The meeting will open with a symposium on syphilis at which Dr. Charles C. Dennie, Kansas City, Mo., will be the guest speaker. Another symposium will be on pediatric subjects with Dr. Philip C. Jeans, Iowa City, as the guest speaker. Other guests will be:

Dr. Clayton J. Lundy, Chicago, Early Diagnosis and Prevention of Rheumatic Heart Disease.
Dr. Karl A. Meyer, Chicago, Cancer of the Stomach.
Dr. John Zahorsky, St. Louis, The Clinical Aspect of Poliomyelitis.
Dr. Lawrence P. Engel, Kansas City, Mo., title to be announced.
Dr. August A. Werner, St. Louis, Female Sex Hormones.
Dr. Géza de Takáts, Chicago, Diagnosis and Management of Peripheral Vascular Disease.
Dr. Vilray P. Blair, St. Louis, title to be announced.

Drs. Werner, Engel and Meyer will also speak at a luncheon meeting Wednesday and Drs. Blair and de Takáts Thursday. Dr. Dennie will address a dinner meeting Tuesday on "The Effect of Malaria on Syphilis and Other Diseases in South America," and Dr. Lundy will show a motion picture on "Interpretation of a Normal Electrocardiogram." Dr. Homer Davis, Genoa, is president of the association.

NEVADA

Annual Registration Due May 1.—All persons holding licenses to practice medicine in Nevada are required by law to pay annually to the treasurer of the Board of Medical Examiners on or before May 1 a tax of $2. Failure to do so operates to forfeit a licentiate's right to practice medicine, and his license to practice can be reinstated thereafter only on the payment of a $10 penalty.

NEW YORK

Buffalo Alumni Meeting.—The fourth annual "Spring Clinical Day" sponsored by the Alumni Association of the University of Buffalo School of Medicine will be presented April 23 at the Hotel Statler, Buffalo. The guest lecturers will be Drs. Albert A. Berg, Russell L. Cecil and Robert A. Cooke, New York; William Boyd, Toronto, Ont.; Donald Guthrie, Sayre, Pa.; Walter I. Lillie, Philadelphia, and William P. Murphy, Boston. Dr. Francis D. Leopold, Buffalo, as president of the alumni association, is general chairman for the event.

Health Commissioner Honored.—Dr. Henry Burton Doust, health commissioner of Syracuse, was guest of honor at a luncheon given by the Onondaga Health Association and a dinner given by the Onondaga County Medical Society April 5, celebrating his thirty years of service to the city. Dr. Doust established the tuberculosis bureau in the department of health in 1908 and remained as its head until his appointment as health officer last January. He is professor of clinical medicine at the Syracuse University School of Medicine and has served as president of the Onondaga County Medical Society and the Syracuse Academy of Medicine.

Society News.—The New York State Association of Public Health Laboratories will hold its twenty-second annual meeting May 23 at the Mary Imogene Bassett Hospital, Cooperstown.——Dr. Raphael Schillinger, Brooklyn, addressed the Buffalo Radiological Society and the Buffalo Otolaryngological Society February 14 on "Roentgenologic Aspects of Mastoiditis."——Dr. Douglas Quick, New York, will address the Syracuse Academy of Medicine, April 19, on "Present Trends in the Treatment of Cancer."——Dr. Abraham H. Aaron, Buffalo, addressed the quarterly meeting of the Ontario County Medical Society, Geneva, April 12, on "Medical Treatment of Gastrointestinal Patients in Whom Surgery Has Failed."——The Obstetric Society of Syracuse Hospitals was recently formed with Dr. Ferdinand J. Schoeneck as president and Dr. Glenn A. Wood as secretary.

New York City

Professor Appointed.—Dr. Joseph F. McCarthy, professor of clinical urology, New York Post-Graduate Medical School, has been appointed professor of urology and attending urologist to the New York Polyclinic Medical School and Hospital. Dr. McCarthy graduated from Columbia University College of Physicians and Surgeons in 1901.

The Adam Miller Lecture.—The second Adam M. Miller Memorial Lecture was delivered at the Long Island College of Medicine March 23 by Dr. George L. Streeter, Baltimore, of the department of embryology, Carnegie Institution of Washington, on "Recent Advances in Knowledge of Early Stages of Development in Primates." The lectureship was established in memory of the late Adam M. Miller, M.A., dean and professor of anatomy at the college.

Medical College Dinner.—The annual dinner of the New York Medical College and Flower Hospital and the Fifth Avenue and New York Ophthalmic hospitals was held March 18 at the Waldorf Astoria. The speakers were Drs. Arvid Lindau, professor of pathology and bacteriology, University of Lund, Sweden, on "Pathogenesis of Gastric Ulcer" and Fordyce Barker St. John on "Surgical Treatment of Gastric Ulcer, with Report of 800 Cases Over a Twenty Year Period."

Society News.—A program of papers on syphilis was presented before the Medical Society of the County of New York March 28 by Drs. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C.; David J. Kaliski, George Miller MacKee and Howard Fox.——Dr. Norman E. Titus addressed the New York Physical Therapy Society, March 2, on "Electrotherapy in Fibromyositis"; Jerome Weiss and Hans J. A. Behrend, "Advances in the Treatment of Foot Disabilities with Special Reference to Prophylaxis."——Drs. Condict W. Cutler Jr. and Carl Eggers addressed the New York Surgical Society March 9 on "Conservative Surgery for Peptic Ulcer."

Cancer Exhibit for the World's Fair.—Plans for an exhibit sponsored by the New York City Committee of the American Society for the Control of Cancer at the New York World's Fair 1939 were recently announced. The exhibit will consist of models and dioramas primarily designed to show the weapons that can be used in fighting cancer. Dioramas showing the Curies at work, Roentgen in his laboratory, historical scenes in the development of surgery, models of high voltage x-ray tubes, and models showing the mining of radium will be included. A motion picture showing the progress of experimental work on cancer and a figure of a woman etched on glass and lighted from the back to show how the disease spreads are other features. The members of the committee to select the subject matter for the exhibit are Drs. Francis Carter Wood, John C. A. Gerster, Ira I. Kaplan, New York; Mandel H. Weinstein, Long Island City; Bowman C. Crowell, Chicago; Stanley P. Reimann, Philadelphia; Miss Katherine Faville, Mrs. Robert G. Mead and Mrs. Francis J. Rigney.

OHIO

Postgraduate Day in Youngstown.—The annual Postgraduate Day sponsored by the Mahoning County Medical Society will be held April 28 at the Hotel Ohio, Youngstown. The speakers will be Drs. Frank H. Lahey, Gilbert Horrax, Everett D. Kiefer and Elmer C. Bartels, all of Boston.

Society News.—Dr. Isidor S. Ravdin, Philadelphia, addressed the Summit County Medical Society, Akron, March 1, on "Surgical Problems of the Biliary Tract."——Dr. Morris Edward Davis, Chicago, addressed the Mahoning County Medical Society, Youngstown, March 15, on "Treatment of Hemorrhage Occurring Late in Pregnancy."—— Drs. Joseph H. Barach, Pittsburgh, and Thomas E. Newell, Dayton, addressed the Stark County Medical Society, Canton, at its annual meeting February 9 on "The Present Status of Medicine in South American Countries."—— Dr. William G. Lennox, Boston, addressed the Academy of Medicine of Cincinnati March 15 on "Migraine and Epilepsy—Newer Concept and Treatment." Dr. Alfred Blalock, Nashville, Tenn., addressed the academy March 8 on "Hypotension and Hypertension."——Dr. Stanley E. Dorst, Cincinnati, addressed the Toledo Academy of Medicine, March 4, on "The Role of Vaccine Therapy in Bacterial Sensitivity."

PENNSYLVANIA

Society News.—Drs. David L. Farley and Walter Estell Lee, Philadelphia, were the guest speakers at the annual spring clinic of the Lycoming County Medical Society at the Williamsport Hospital, April 8. In the morning both officiated at clinics and in the afternoon Dr. Farley presented a paper on "Recent Advances in the Field of Hematology" and Dr. Lee

on "Tumors of the Intestinal Tract."——Dr. Herbert Lund, Uniontown, addressed the Fayette County Medical Society, Uniontown, April 7, on "Medicolegal Aspects of Recent Court Trials."——Dr. Louis W. Wright, Harrisburg, addressed the Dauphin County Medical Society, Harrisburg, March 1, on "Problems, Diagnosis and Treatment of Syphilis."

Seminars for Practitioners. — The Schuylkill County Medical Society will sponsor six graduate seminars at the Pottsville Hospital beginning April 21 and continuing on succeeding Thursdays. The following program is announced:

Dr. Jesse O. Arnold, Philadelphia, Common Obstetric Problems.
Dr. Edward J. G. Beardsley, Philadelphia, Clinical Diagnosis.
Dr. Elliott P. Joslin, Boston, Diabetes.
Dr. Ralph M. Tyson, Philadelphia, Pediatric Diseases.
Dr. Hugo Roesler, Philadelphia, Heart Disease and Electrocardiography.
Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, Modern Obstetrics versus Old-Fashioned Maternity Care.

Philadelphia

Postgraduate Institute. — The third annual Postgraduate Institute of the Philadelphia County Medical Society was held March 28 to April 1 at the Bellevue-Stratford Hotel with a registration of 1,705. The general subject was "Diseases of the Digestive Tract," discussed in eighty-seven lectures by Philadelphia physicians and in scientific and technical exhibits. Dr. Arthur C. Christie, Washington, D. C., delivered the annual J. Chalmers DaCosta Foundation Lecture, Wednesday evening March 30 on "Comprehensive Planning for Medical Care—the Physician's Responsibility." At this meeting Dr. Frederick J. Bishop, Scranton, president of the Medical Society of the State of Pennsylvania, and George H. Meeker, Ph.D., dean of the University of Pennsylvania Graduate School of Medicine, also made addresses. Dr. Rufus S. Reeves was chairman of the committee that organized the institute.

Pittsburgh

Joint Obstetric and Gynecologic Meeting.—The Obstetrical and Gynecological Society of Allegheny County had a joint meeting with the obstetric and gynecologic section of the Academy of Medicine of Cleveland April 4. Clinics were held at the Allegheny General and Magee hospitals and in the evening papers were presented by Drs. James S. Taylor, Altoona, on "The Incidence of Cesarean Section in Allegheny County"; Arthur J. Skeel, Cleveland, "Reducing Maternal Mortality in Cleveland," and Robert L. Faulkner, Cleveland, "Gynecological Mortality Rate at the Cleveland University Hospitals."

VIRGINIA

Society News. — Drs. Lawther J. Whitehead, Richmond, and Wright Clarkson, Petersburg, addressed the Mid-Tidewater Medical Society, West Point, recently, on "Treatment of Acute Infections with X-Ray" and "Cancer and Its Treatment by Radium and X-Ray" respectively. Dr. Hawes Campbell, Enfield, discussed "Distribution of Public Welfare Funds in the Counties and Cities of Virginia."——Dr. Henry B. Mulholland, Charlottesville, addressed the Nansemond County Medical Society, Suffolk, recently, on new advances in therapy.

WASHINGTON

Society News.—Dr. Frank R. Menne, Portland, Ore., was the guest speaker at the annual meeting of the Tacoma Surgical Club April 2; the program was devoted to discussions of cancer. —— Drs. Albert W. Holman and Herbert V. Thatcher, Portland, addressed the Cowlitz County Medical Society, Longview, February 9, on "Extra-Uterine Pregnancy" and "Surgery of the Hand" respectively. —— Drs. Clyde R. Jensen and Kyran R. E. Hynes, Seattle, addressed the Grays Harbor County Medical Society, Aberdeen, in February on "Arteriosclerosis, Hypertension and Diet" and "The Clinical Approach to Jaundice" respectively.——Drs. George D. Capaccio, Seattle, and Edwin E. Osgood, Portland, addressed the Pierce County Medical Society, Tacoma, January 25, on edema and anemia, respectively.——At a meeting of the Yakima Valley Medical Society, Yakima, February 14, the speakers were Drs. Albert C. Stewart and Carroll C. Carlson, Tacoma, on "Hospitalization for the Neurotic Patient" and "The Present Status of Medical Treatment of the Psychoses" respectively. ——Drs. Joseph W. Shaw and Stephen T. Parker, addressed the King County Medical Society, Seattle, March 21, on "Treatment of Early Syphilis" and "General Principles in Treatment of Syphilis" respectively.——Dr. Emile F. Holman, San Francisco, guest speaker at the annual meeting of the Seattle Surgical Society, February 4-5, spoke on "Peripheral Vascular Disease: Diagnosis and Treatment" and "Indications for and Technic of Splenectomy."

GENERAL

Child Health Day.—May-Day—Child Health Day sponsored by the Children's Bureau at the request of the State and Provincial Health Authorities of North America will be observed Sunday May 1 with supplementary observances April 30 and May 2. This year's slogan will be "Speed children on the road to health." State health officers are to appoint state chairmen to arrange for activities of public and private organizations.

Remington Medal Award.—The Remington Medal of the New York branch of the American Pharmaceutical Association will be awarded to Henry C. Christensen, Pharm.M., Chicago, secretary of the National Association of Boards of Pharmacy, it is announced. Mr. Christensen was appointed to his position with the national association in 1914. He has been a councilor of the American Pharmaceutical Association since 1925 and was president in 1930.

International Cancer Congress in 1939. — Dr. Francis Carter Wood, New York, is president and Dr. Donald S. Childs, Syracuse, N. Y., is secretary-treasurer of the third International Cancer Congress, to be held in Atlantic City Sept. 11-16, 1939, with headquarters at Haddon Hall. Dr. Alfred L. Loomis Bell, Brooklyn, is in charge of transportation and exhibits. Sections proposed for the congress are general research, biophysics, genetics, general pathology, surgery, radiologic diagnosis, radiotherapy, statistics and education. The membership fee will be $15. Inquiries should be addressed to the Institute of Cancer Research, 1145 Amsterdam Avenue, New York, N. Y.

Survey of Radium Supply.—About 82 Gm. of radium is owned by 213 hospitals surveyed in forty-seven cities in the East and Middle West, according to preliminary reports of a survey being conducted by the Eldorado Radium Corporation, which owns the Eldorado mines on Great Bear Lake in Canada, discovered seven years ago. At the present price of $25,000 a gram, this amount is valued at about $2,050,000. The largest single holder is Bellevue Hospital, New York, with 9.5 Gm.; second is Memorial Hospital, New York, with 8.9 Gm. Others with a large supply include State Institute for the Study of Malignant Diseases, Buffalo, 8.25 Gm., and Michael Reese Hospital, Chicago, 6.5 Gm.

Otorhinolaryngologists to Meet. — The forty-fourth annual meeting of the American Laryngological, Rhinological and Otological Society will be held in Atlantic City April 27-29. Two symposiums are announced, one on laryngeal cancer and one on allergy. In the first the speakers will be Drs. Henri Coutard, Paris and Chicago; Paul Klemperer, William Harris and Charles J. Imperatori, New York; Henry B. Orton, Newark, N. J., and LeRoy A. Schall, Boston. On allergy the speakers will be Drs. Maximilian A. Ramirez and Marvin F. Jones, New York; French K. Hansel, St. Louis, and Harris P. Mosher, Boston. One session will be devoted to consideration of "Chemoprophylaxis as a Means of Preventing Poliomyelitis"; Dr. Rea E. Ashley, San Francisco, will give an address and Dr. Austin A. Hayden, Chicago, will present a motion picture on the practical application of the technic. Other addresses will be:

Dr. Victor E. Negus, London, Evolution of the Speech Organs of Man.
Dr. David R. Higbee, San Diego, Further Observations on the Autonomic Nervous System.
Dr. Henry L. Williams Jr., Rochester, Minn., The Underlying Factors Concerned in Otitic Hydrocephalus.
Dr. John A. Kolmer, Philadelphia, Sulfanilamide in the Treatment of Experimental Streptococcus and Pneumococcus Meningitis.
Dr. Samuel J. Crowe, Baltimore, Diagnosis and Differential Diagnosis of Deafness.
Dr. Max A. Goldstein, St. Louis, Thyroxine Therapy in Otosclerosis.
Dr. Horace J. Williams, Philadelphia, Otitis Media and Orbital Cellulitis in Scarlet Fever and a Preliminary Report on the Loss of Hearing in This Disease.

Dr. Samuel J. Kopetzky, New York, is president of the association and Dr. Harold I. Lillie, Rochester, Minn., is president-elect.

Government Services

Congress of Military Medicine

Major General Charles R. Reynolds, surgeon general, U. S. Army, has been designated by President Roosevelt as president of the permanent committee of the International Congress on Military Medicine and Pharmacy, which will meet in Washington, D. C., in May 1939. At that meeting General Reynolds will become chairman of the organizing committee and president of the congress. This is the first meeting of this congress, organized at the close of the World War, in the Western Hemisphere.

V 1
193

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 19, 1938.

The Law Relating to Abortion

An important debate on the law relating to abortion, in which both the medical and the legal profession took part, was arranged by the Fellowship of Medicine. Sir Beckwith Whitehouse, gynecologist, proposed the motion "That the law of abortion requires reform." He described the law as harsh in its implications as regards the potential mother. Pregnancy could be legally terminated only when the mother's or the child's life was threatened. The law had not the slightest interest in the mother, apart from dissolution. Both the medical and the legal profession were endeavoring to find loopholes in the law for making an obvious wrong a right. We no longer subscribed to the doctrine that the life of the child was paramount and that so long as the mother's life was preserved it did not matter what physical or mental wreck she became. Abortions, including so-called therapeutic abortions, were increasing. It was with regard to abortions undertaken for bona fide medical reasons that he asked for reform of the law. As the law stood, they were illegal. As suggested in Taylor's "Jurisprudence," the law should be reenacted by inserting the proviso "to exempt from liability the fully qualified practitioner who terminated pregnancy for the bona fide purpose of preserving the mother from special danger to life or health." But two clauses should be introduced to tighten up certain weaknesses in the preceding clause. Illegal though it was, so-called therapeutic abortion was being performed today by well known members of the medical profession for indications which were not accepted by others. He was skeptical about the sympathetic attitude with which the problem was sometimes approached. If the law should be reformed to include the health of the mother as an indication, the number of such cases would increase. Two weapons were available against the unscrupulous patient and the "sympathetic" practitioner: (1) notification of all cases of therapeutic abortion before the operation is performed; (2) the unanimous agreement and consent of a board of three individuals —the family physician, the surgeon who performs the operation, and a disinterested physician, surgeon, obstetrician or alienist with a special knowledge of the condition for which the operation is suggested. Notification would act as a deterrent to the potentially criminal type of applicant. Notification should be to one of the health authorities, preferably the county authority or the Ministry of Health, to avoid local publicity of domestic details. The reform would tighten up the existing law and limit the activities of medical abortionists. No hardship would be imposed on the genuine patient, and the division of responsibility would be welcomed by the bona fide practitioner. If "reform" simply implied increased license to perform an operation which the majority of obstetric surgeons detested, Sir Beckwith Whitehouse would be no party to it.

Opposition to the motion was led by Dr. W. H. F. Oxley, who said that agitation for reform came from three groups: (1) those who wished to enlarge the scope of abortion so as to include all cases in which a woman wished to have her pregnancy terminated, whatever the reason; (2) those who aimed at reduction of illegal abortions by increased stringency of the law; (3) physicians anxious to have a clear statutory definition of the indications which would make artificial termination of pregnancy lawful. Only the two latter groups need be considered, as the thesis of the first was immoral. There was no proof that abortion was increasing in this country; the deaths due to it had remained steady. While he agreed with the object of the second group, he believed that their methods would be ineffective. Illegal abortion was clandestine and therefore the cases in which information was desired would be the ones in which it was not forthcoming. The vast majority of abortions were brought about by simple means by respectable married women for economic reasons, and physicians were not called in at all. The physician should perform abortion only for preserving the life or health of his patient and not for sociologic or eugenic reasons. He did not believe there ever was a prosecution of a physician who kept within his province.

Dr. Letitia Fairfield thought that the practical interpretation of the law as regards the health of the mother was so broad that it did away with the necessity for the very limited reform advocated. The medical board of three meant formalism, delay, obstruction and interference in clinical matters. Mr. Kitchin, lawyer, would like to see the law declare that it is lawful for a physician to induce abortion if he believes in good faith that the pregnancy would be injurious to health. He would also include the rare cases in which pregnancy follows rape or incest. On a show of hands there was a majority, but not a large one, in favor of the motion.

Increase in Number of Medical Students

The following figures have been published:

Medical Students in the British Isles

	Men	Women	Total
1928	7,279	1,108	8,387
1935	11,176	1,747	12,923
Percentage increase	+53.5	+57.7	+54.2

Guy's Hospital Gazette considers that these figures give cause for alarm. A few years ago there was in England one physician to every 800 of population, a figure which was considered to indicate that the saturation point had been reached. During the period of seven years from 1928 to 1935, while the population has not increased by 4 per cent, the number entering the medical profession has increased by more than 50 per cent. Such a relative increase of physicians to the population must mean that the public will pay more for medical care or that physicians will earn less or, more probably, both. It is not an inviting prospect for the medical student, whose training yearly becomes more exacting.

PARIS

(From Our Regular Correspondent)

March 19, 1938.

Curie Hospital May Close for Lack of Funds

The Hospital and Radium Institute of the Curie Foundation may be forced to close unless a large subsidy is given by the city of Paris. During the past year there has been a sharp decline in the revenues of the foundation, whose work is known all over the world. The chief sources of revenue in the past have been donations and government subsidies, in both of which a constantly increasing diminution has been noted. The increase in the cost of maintenance of the hospital and the institute has made it necessary to consider their closing unless a relatively substantial subsidy can be secured from the city of Paris. A strong effort is being made by leading members of the city council to grant such a subsidy.

Erythema Nodosum and Pulmonary Tuberculosis

Two recent papers again call attention to the association of erythema nodosum and pulmonary tuberculosis. Dr. Etienne Bernard and his associates at the January 7 meeting of the Société médicale des hôpitaux stated that erythema nodosum appears to have a definite place in cases of pulmonary tuberculosis. It has been most commonly reported as being observed at the period of primary infection; i. e., the period of hyperallergy. Their patient was a woman aged 39, who presented the clinical picture of a relatively benign pleuropulmonary tuber-

culosis a year before. About ten months later a recurrence of the pleurisy was noted, accompanied by erythema nodosum. The latter did not appear at the time of the primary infection, thus differing from cases reported by other French phthisiologists.

At the January 14 meeting Dr. M. J. Comby told of a man aged 26 whose father had pulmonary tuberculosis. At the age of 4 years the patient had an acute serofibrinous pleurisy from which he had apparently recovered. The erythema nodosum did not appear until seventeen years later, so it was necessary to be careful in stating that an erythema nodosum appeared only during a primary tuberculous infection. Dr. P. G. Jacob stated that erythema nodosum could be present at any stage of a pleuropulmonary tuberculosis. These cases were not as rare as commonly believed. Dr. Jean Troisier said that in 95 per cent of the cases the erythema nodosum is the sign of a recent primary infection. It is often seen at the time when a negative tuberculin skin test becomes positive. He believed that in Dr. Comby's case the attack of pleurisy at the age of 4 years had been a primary tuberculous infection and the second attack at the age of 26 years a reinfection. Dr. Hallé was of the opinion that more and more evidence was being compiled to show the tuberculous nature of erythema nodosum. In some cases studied by Debré, Saenz and others the bacilli had been found in cultures taken from the lesions. The lesions appear almost symmetrically on the arms and legs near the elbow and knee, never elsewhere. They are accompanied by gastrointestinal symptoms and do not show any tendency to break down, as does a lupus vulgaris. In other types of tuberculous skin lesions observed in children, there is an absence of such a symmetrical distribution.

Physicians Set Example in Raising Large Families

In the March 6 issue of the *Concours médical* an editorial by Dr. J. Noir states that the decrease in the number of births in France is becoming serious. The number of deaths constantly exceeds the number of births. Of ten million families, there are less than three children in more than seven million families. A praiseworthy effort is being made by the government to raise the birth rate by granting allowances which increase in proportion to the number of children in each family. These allowances, or allocations as they are termed here, are conscientiously distributed among the laboring class, but sparingly in the agricultural and moderate income groups. The medical profession in France has not waited to receive government aid to encourage the raising of large families but has formed an independent organization which already includes sixty-one medical families of more than ten children each. The majority of the fathers are physicians in country districts or small towns. One physician is listed as having seventeen, another sixteen and a third fifteen children.

Rockefeller Foundation Endows Chair of Neurosurgery

About $50,000 has just been granted to the Medical School of the University of Paris to establish a chair in neurosurgery. The first to occupy this position will be Dr. Clovis Vincent, whose contributions to this special field are widely known. Unable to secure beds in the public hospitals of Paris, Dr. Vincent organized his own hospital, where more than 600 brain operations were performed in 1937. With the cooperation of the public hospital authorities, he will now have wards at his disposal for neurosurgical work. Opportunity for research in this field will be greatly aided by the Rockefeller Foundation Endowment.

New Public Health Decoration

The minister of public health, Mr. Rucart, has established a new form of reward for those who render meritorious service in public health. The new order will have three grades or ranks: chevaliers or knights, officers and commanders. The official ribbon worn by those on whom this honor is bestowed will be blue.

Death of Prof. Félix Mesnil, Parasitologist

Another of the original group of co-workers of Louis Pasteur has passed away at the age of 70 years. He became associated with the Pasteur Institute in 1892 and made a special study of parasitology. One of his earlier contributions was a book on trypanosomes and trypansomiases written in collaboration with Professor Laveran. He was one of the first to introduce chemotherapy in the treatment of tropical diseases and organized the teaching of tropical medicine at the Pasteur Institute of Paris. His pupils are scattered all over the globe. For thirty-five years he occupied the position of editor of the Bulletin of the Pasteur Institute.

VIENNA

(From Our Regular Correspondent)

March 10, 1938.

Epidemic of Psittacosis in Vienna

Vienna was recently much disturbed to learn that several members of one of the city's best known and most distinguished theatrical families, who had been suffering from an obscure illness, had been admitted to the hospital with symptoms suggestive of psittacosis. Public interest increased when subsequently it became known that the attending physician and the consultant internist, Professor Hitzenberger, had shown the same symptoms and were hospitalized. That the disease was psittacosis had been declared by Professor Hitzenberger himself, who apparently had become infected on his first visit to the ailing actors. While waiting for the identification of the causative agent of psittacosis, which bacteriologic work is done at the Veterinary Research Institute in Moedling, the number of persons affected by the epidemic had risen to twelve, now including not only members of the theatrical family and the two doctors but the servants and two callers on the family. There was one fatality. The sources of infection were found to have been a zebra-parrakeet purchased six weeks before and a canary that had been a household pet for many years. Observations made at the Veterinary Research Institute in Moedling, of which Professor Dr. Gerlach is director, show that the filtrable virus of psittacosis often may be present as a latent infection in apparently healthy birds, which act as "bacillus carriers." Transmission can take place by means of contaminated bird seed and the sneezing of sick birds, or the disease may be communicated as a "dust disease." As psittacosis is highly contagious, the laboratory and hospital workers have to be protected by special measures such as the wearing of masks and rubber gloves. The health authorities issued a warning over the radio to all owners of zebra-parrakeets and other cage birds to exercise the utmost caution in handling them. In Vienna, especially during the last few years, a vast number of small psittaceous birds have been bred and marketed, the keeping of these creatures having assumed the proportions of a veritable fad. Following the outbreak of this epidemic, however, many perturbed people turned their pets over to the animal shelters. The course of the disease in the eleven surviving patients was somewhat as follows: high continued fever with temporary remissions, multiple lobular foci in the lungs, great prostration; in short, the clinical picture of a lingering influenza in which the true state of affairs is disclosed by laboratory tests. In small epidemics previously observed the mortality lay between 10 and 20 per cent.

Axillary and Rectal Temperatures in Acute Abdominal Disorders

During the past fifteen years Professor Dr. Demmer has been concerned with the fact that often in the course of various diseases noteworthy differences are evidenced between simultaneously recorded temperatures in the axilla and in the rectum. Dr. Demmer recently reported the results of his studies before the Gesellschaft der Aerzte at Vienna. He studied the records of simultaneous axillary and rectal temperatures in 2,050 cases

V 11
1938

of acute inflammatory abdominal disorders. In each case the normal divergence of 0.5 degree C. was greatly exceeded, the variations ranging from a minimal 0.7 degree to 1.7 degrees. Dr. Demmer considers this abnormal circumstance an indication for operation regardless of the absolute temperature levels. His judgment has been virtually always corroborated by the condition revealed at operation. The author ascribes particular importance to a constant abnormal difference in temperature between axilla and rectum as evidence that peritonitis threatens, even if other classic symptoms are absent. Of the 2,050 cases, 1,400 represented acute appendicitis and operations were performed in 35 per cent of these rather late in the course of the disease, in some cases too late to save life. In 217 (14 per cent) of the 1,400 cases of appendicitis only imperfect classic symptoms had developed; in eighty-four cases (6 per cent) such symptoms were lacking. Conversely, abnormal difference between axillary and rectal temperature was absent, on the basis of positive clinical and surgical observation, in only eleven cases (8 per thousand). The difference was manifested in only twenty-one cases (1.5 per cent) with no inflammation of the organ. According to the foregoing determinations, the classic symptomatology was marked in 14 per cent. On the contrary the axillary-rectal temperature symptom was defective in only 8 per cent in which the pathologic conditions were disclosed at operation and in 1.5 per cent of the operations which revealed no abdominal inflammation. Thus in the vast majority of cases the temperature difference provides almost sure criteria with regard to the presence of a pathologic abdominal process (peritoneal irritation) necessitating surgical intervention. Greater importance should be attached to a difference that has increased within the space of a few hours than to a constant difference, although the latter is also extremely pathognomonic. Since in elderly persons cutaneous temperature is as a rule only slowly adjusted to an increased temperature of the internal organs, the sign is especially likely to be manifested in older patients. The sign affords a means of differentiating extraperitoneal inflammatory processes from intraperitoneal conditions which threaten life and which urgently require treatment. The abnormal difference in temperatures provides a timely indication for surgical treatment of a threatening peritonitis and thus saves precious time that otherwise might be lost in a fruitless establishment of organic diagnosis. If one properly interprets this sign, obscure abdominal disturbances can be quickly recognized as inflammatory or noninflammatory. In the discussion, many of those present, including some of the internists, corroborated the soundness of the guiding principles outlined. Many internists have observed that among elderly patients pneumonia, migraine and coronary thrombosis may all run a course without elevation of axillary temperature although simultaneously the rectal temperature may show clear elevations. Increased difference in temperature is, however, most important for surgical considerations and should be evaluated as a warning signal.

Knowledge of Hydrocephalus

The neurologist Professor Marburg recently read a paper in the Gesellschaft der Aerzte on the problem of hydrocephalus, in which he stated that the term "hydrocephalus" denotes a pathologic increase in the amount of cerebral fluid and a concomitant dilatation of the cerebral ventricles. As etiologic factors traumas, syphilis and inflammations are to be considered, besides other processes which signify only an increased permeability of the vessels and the hematoencephalic barrier without manifestation of inflammation. Clinically hydrocephalus is differentiated as fetal (balloon head), early infantile (mostly caused by trauma at parturition), late infantile, juvenile or adult. Significant syndromes are hydrocephalus-epilepsy, intracranial pressure syndrome, hemiplegia syndrome, Nonne's syndrome and dysglandular syndrome. These conditions are now best distinguished by means of roentgenography and above all by ventriculography and encephalography. By the use of a contrast medium the diagnosis has been made so much easier that resorption tests have come to be dispensed with. Hydrocephalus is a problem of permeability of the vessels. This accounts for the excess flow of cerebral fluid into the ventricles, which causes the latter to become dilated. The condition becomes regulated and stabilized by means of the metabolism, the production of hormones and the nervous system. The therapeutic approach must be through these channels. The most favorable results have been achieved by roentgen therapy; other measures are merely symptomatic and palliative. In the discussion, pediatricians and roentgenologists present stressed the value of roentgen irradiation in hydrocephalus but also pointed out that frequently serous meningitis or slowly developing cerebral tumors and cerebral tubercles can present a clinical picture similar to that of hydrocephalus. Statistics collected by the neurosurgeon Schoenbauer were cited: Of 1,372 brain operations in his service, only thirteen were undertaken solely to relieve hydrocephalus. In only one of these thirteen cases was uncomplicated primary hydrocephalus proved by intervention and necropsy. In four other cases on the basis of some other diagnosis it was decided to operate and primary hydrocephalus was found. In 60 per cent of all cases of space-infringing cerebral processes (tumors, inflammations and so on) hydrocephalus will be present. If such patients are first treated with roentgen rays their condition usually deteriorates and they come to operation in bad condition. Accordingly Schoenbauer recommends the establishment of the diagnosis of "simple hydrocephalus" before any irradiation has been tried.

Radon in Treatment of Pleural and Peritoneal Exudation

Dr. Laszlo recently reported to the Gesellschaft der Aerzte on radon insufflation of the thoracic and abdominal cavities in cases of carcinomatous pleurisy and peritonitis. This procedure, followed by the speaker since 1935, tends to inhibit formation of exudate and to reduce the required number of punctures to a minimum. Laszlo insufflated 300 cc. of oxygen through a fluid containing 500,000 mache units of emanation. He treated a patient with carcinomatous pleurisy following mastectomy, whose condition had required frequent puncture, with an "emanation pneumothorax." Small quantities of insufflated gas sufficed to induce the desired remission of the exudative process. Dr. Laszlo used the same therapy repeatedly in similar cases as well as in ascites. Whereas formerly, in cases of carcinomatous effusion, puncture was necessary every two or three days, the emanation therapy checked the production of effusion so effectively that intervals of from two to three weeks and even longer were permissible.

ITALY

(From Our Regular Correspondent)

Feb. 15, 1938.

International Congress of Pediatricians

The fourth International Congress of Pediatricians, held at Rome, was attended by 900 practitioners from all parts of the world; thirty-eight countries were represented. The executive committee was headed by Professor Spolverini, director of the Clinica di Roma. In his address of welcome he reminded his hearers that ancient Rome in imperial times was the source of much precautionary legislation with regard to problems of demography, of the nursling and of the child. Among the promulgators of such measures were Julius Caesar, Augustus and Trajan. The speaker also mentioned the fact that the first foundling hospitals were instituted in medieval Rome. He then went on to describe the principal social agencies and legal provisions which safeguard the infant and the younger generation in the Rome of today.

The first theme for discussion was social and clinical aspects of the neuropsychoses encountered in pediatric practice.

Speakers were Jundell of Sweden, Glanzmann of Switzerland, Allen of the United States and others. After an expansive development and discussion the following resolution was adopted:

1. Psychoneuroses of childhood and the concomitant problems of child training form an important part of pediatrics.

2. These disorders should be a concern of the ward and outpatient services of every pediatric clinic.

3. Courses in pediatrics ought to give adequate consideration to the therapy of these conditions, and to their prophylaxis through proper training.

4. It is of paramount importance that doctors, especially pediatricians and school medical officers, should act as instructors of the public and should advise parents with regard to various problems of child guidance and training.

5. The authorities ought to provide the medical profession the necessary support in these activities; the practitioner should be afforded the opportunity to improve his training by direct educational contact with the populace.

On the motion of Professor Pechère it was recommended that all secondary schools and especially girls' high schools should offer instruction in child psychology.

The second theme for discussion was the relation of mineral metabolism and water exchange in early childhood to the problem of artificial feeding. Papers were read by McQuarrie of the United States and Csapó of Hungary. McQuarrie first reviewed the diverse composition and dynamic function of the bodily water content, both the intracellular fluid (70 per cent of the total) and the extracellular fluid (the latter is subdivided in its turn into intravascular and interstitial fluids). He then discussed the physiologic and clinical importance of the semipermeable membranes interposed between the two systems. On these membranes depends the maintenance of approximately uniform osmotic concentration values in the body fluids. These fluids and the blood plasma bear a striking resemblance to the secretions of the gastro-enteric tract, at least with respect to the ionic structure, however great may be the differences in chemical composition. These data have been practically applied with notable success to the problems of vomiting and diarrhea of infants as well as to the effects of electrolytic and acid base equilibrium.

In the second paper Csapó provided detailed illustrations of the interrelation of water and salt exchange, which are in close correlation in the healthy nursling but which follow diverse paths if the baby is ill. This is especially perceptible in acute nutritional disorders. Of the various factors that regulate water exchange the author believes that those pertaining to the kidneys are the most important; the capability of dissolution is not always perfect.

The third topic on the agenda was childhood tuberculosis. The discussion was divided into three subheadings: (1) recent studies of ultravirus, (2) contagiousness of tuberculosis in infants and (3) prophylaxis and therapeutics. Part 1 was dealt with by Professors Dufourt of France and Cohen of Belgium, assisted by Aguirre of Argentina and Fiore of Italy. The conclusions formulated by the speakers occasioned a lively debate: the convinced adherents of the ultravirus theory (Fiore, Frontali, Dufourt) versus the opponents of the theory. Cohen remained uncertain. The most impressive arguments were advanced by Professor Petragnani, director general of public health for all Italy. He scouted the alleged existence of ultravirus and especially the possibility of experimental demonstration of an ultravirus of tuberculosis by means of our present equipment.

The problems of prophylaxis and therapeutics were sources of further controversy. Papers on these themes were submitted by Noeggerath of Germany and Chester Stewart of the United States. The congress was in accord with respect to the fundamental need for various social regulations and facilities for isolation, but there was some difference of opinion with regard to the relative feasibility of various prophylactic measures. Questions were raised as to the practicability of vaccination and whether it should be carried on with live bacilli (which procedure is not entirely free from danger) or with dead bacilli (the efficacy of which is challenged by many authors). The Italian school insisted on the efficacy of prophylactic inoculation with dead germs and Professor Petragnani announced that new experiments were being conducted on the applicability of an inhalation antitoxin, his own concept.

It was decided to hold the next International Congress of Pediatricians in the United States.

Mediterranean Fever

At a medical meeting in Faenza, Dr. Giulio Drei talked on Mediterranean or undulant fever as it is encountered in that region of Italy known as Romagna. The author cited various discussions and publications to establish that this disease was unknown in Romagna till some twenty years ago. Subsequently, at intervals, cases have been reported within the region but the diffusion has been remarkable. The contagion is imported principally by herds of sheep which are penned up for the winter in the neighborhood of tenant farm houses. The numerous springtime abortions occurring among these animals are of the infectious type that tends to become epizootic. As a result of their proximity and contact with the sheepfolds, cattle also may become infected; the farmer first becomes aware that something is amiss when the cows begin to drop stillborn premature calves. On the basis of his epizootic and epidemiologic studies in Romagna, Drei concludes that there are two types of causative agent: The first, Bacillus abortus Bang, causes epizootic abortion but is rarely pathogenic in man; the second, the micrococcus of Bruce, is abortifacient in sheep and cattle and through these intermediate hosts, pathogenic in man as well. As to the mechanism of transmission, from the animal to man, the sum of data indicate that direct contact with an infected beast is usually responsible for isolated cases and that the pathogenic organism follows the alimentary tract.

In the course of the same meeting Professor Giugni emphasized the increased clinical incidence of the disorder, describing how the early enlargement of the liver often exceeded that of the spleen and is a specific sign in differential diagnosis. Treatment with specific vaccine intravenously administered appears the most effective means of abbreviating or (quite frequently) abruptly checking the long febrile course. The author surmises that the apparent failure of serotherapy in some cases and the slight reactions to the serum in others have a basis in the species of the intermediate host: cases in which cattle were inculpated reacted more intensely and more effectively to the serum than cases traceable to contact with sheep. Giugni's observations were confirmed by Professor Fontana, whose personal observations have led him to conclude that sheep rather than cattle are more likely to transmit undulant fever directly to man.

Marriages

RICHARD J. S. SILVIS, A. Surg., Lieut. (j. g.) U. S. Navy, to Miss Naomi Holt, both of Great Lakes, Ill., Dec. 7, 1937.

ANDREW BURNET WHITAKER to Miss Phebe Greenleaf Knight, both of Camden, S. C., in December 1937.

WINSTON TUCKER LA NEAVE JR., Manteo, N. C., to Miss Nellie Rawls of Franklin, Dec. 31, 1937.

JOHN P. SCHELBLE, Milwaukee, to Miss Teresa McCormick of Madison, Wis., Nov. 27, 1937.

EARL M. SLAGH, Elsie, Mich., to Miss Carol May Deegan of Sebewaing, in December 1937.

HARVEY E. HOLTZ, Iowa City, to Miss Arlene Breese of Traer, Iowa, February 12.

JOHN C. TURLEY to Miss Katherine Matthews, both of Memphis, Tenn., January 7.

Deaths

Louis Burgin McBrayer ✠ Southern Pines, N. C.; Louisville (Ky.) Medical College, 1889; for twenty-one years secretary and treasurer of the Medical Society of the State of North Carolina and at one time president; formerly secretary of the Hoke County Medical Society and past president of the Buncombe County Medical Society; coroner of Buncombe County, 1901-1907; health officer of Asheville, 1909-1914; president of the Southern Conference on Tuberculosis, 1925-1926; at one time member and president of the state board of medical examiners; managing director of the North Carolina Tuberculosis Association, 1915-1937; fellow of the American College of Physicians; formerly superintendent of the North Carolina State Sanatorium for the Treatment of Tuberculosis, Sanatorium, and was active in organizing the fight against tuberculosis in the state; was chairman of the board of directors of the North Carolina Odd Fellows Orphanage, of which he had been a member for several years; aged 68; died, April 1.

Norman Jerome Blackwood ✠ Medical Director, Rear Admiral, U. S. Navy, retired, Santa Barbara, Calif.; Jefferson Medical College of Philadelphia, 1888; entered the navy in 1890 and retired in 1930 on or after attaining statutory retirement age; fellow of the American College of Surgeons; superintendent of the Santa Barbara Cottage Hospital; at one time medical director of the Provident Hospital, Chicago; aged 72; died, April 1.

George Franklin Jackson ✠ Little Rock, Ark.; Eclectic Medical University, Kansas City, Mo., 1911; member of the Radiological Society of North America; medical director of the Pyramid Life Insurance Company; on the staffs of the Arkansas Children's Home and Hospital, St. Vincent's Infirmary, Baptist State Hospital and the Missouri Pacific Hospital; aged 49; died, January 25, in a local hospital, of heart disease.

John Franklin Culp ✠ Harrisburg, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1886; member of the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; past president of the Dauphin County Medical Society; aged 72; for many years on the staff of the Harrisburg Hospital, where he died, January 17, of adenocarcinomatosis.

Leonidas Mosby Anderson ✠ Lake City, Fla.; Atlanta Medical College, 1895; past president of the Florida State Medical Association and the Columbia County Medical Society; formerly member of the state board of medical examiners; was recently appointed inspector of the state institutions and administration advisor by the state board of health; aged 76; died, January 21, of carcinoma.

Walter Fred Wiese ✠ Fresno, Calif.; University of Illinois College of Medicine, Chicago, 1915; fellow of the American College of Surgeons; member of the city board of education; on the staffs of the Burnett Sanitarium, St. Agnes Hospital and the General Hospital of Fresno County; aged 49; died, January 29, at the University of California Hospital, San Francisco, of heart disease.

Edward Hill Baldwin, Newark, N. J.; New York Homeopathic Medical College and Hospital, New York, 1895; formerly member of the state board of medical examiners of New Jersey; fellow of the American College of Surgeons; consulting surgeon to the Homeopathic Hospital of Essex County, East Orange and St. Mary's Hospital, Passaic; aged 66; died, January 30, of coronary thrombosis.

William Schuyler Colfax, Pompton Lakes, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; formerly mayor of the borough, president of the board of education, member and president of the board of health and health officer of the community; aged 72; died, January 17, of coronary thrombosis.

Edward Pease Swift, Rye, N. Y.; Hahnemann Medical College of Philadelphia, 1881; emeritus professor of medicine, New York Homeopathic Medical College and Flower Hospital, New York; at one time on the staff of the Metropolitan Hospital, New York; aged 79; died, January 15, of carcinoma of the prostate with metastases to the lungs.

Edward Cargill Ehlers, Essex Fells, N. J.; University and Bellevue Hospital Medical College, New York, 1899; served during the World War; police marshal and formerly health officer of Essex Fells; aged 67; died, January 17, in the Mountainside Hospital, Glen Ridge, of chronic myocarditis and arteriosclerosis.

Wharton Greene Leak, East Bend, N. C.; North Carolina Medical College, Davidson, 1900; member of the Medical Society of the State of North Carolina; aged 63; died, January 19, of diabetes mellitus and streptococcic cellulitis of the arm, following an accidental wound from a hypodermic needle lying on his desk.

Ivy Stansell ✠ San Antonio, Texas; Southern Methodist University Medical Department, Dallas, 1914; served during the World War; police surgeon; formerly member of the staff of the Robert B. Green Hospital; aged 49; died, January 9, in a local hospital, of gastric ulcer, myocarditis and pleurisy.

George Streit, New Haven, Conn.; Yale University School of Medicine, New Haven, 1901; member of the Connecticut State Medical Society; at one time on the staff of the Connecticut State Hospital, Middletown; formerly health officer of Torrington; aged 60; died, January 5, of heart disease.

John Campsey Knox, Washington, Pa.; Ohio State University College of Medicine, Columbus, 1908; fellow of the American College of Surgeons; served during the World War; for many years on the staff of the Washington Hospital; aged 59; died, January 15, of cerebral hemorrhage.

Milton Ellis Lando ✠ Oakland, Calif.; Cooper Medical College, San Francisco, 1900; veteran of the Spanish-American War; for many years on the staff of the Children's Hospital of the East Bay; aged 57; died suddenly, January 31, of arteriosclerosis and cerebral hemorrhage.

Isham Faison Hicks, Dunn, N. C.; North Carolina Medical College, Davidson, 1902; member of the Medical Society of the State of North Carolina; formerly secretary of the Hartnett County Medical Society; aged 61; died, January 21, of chronic myocarditis and phlebitis.

Arthur D. Houghton ✠ San Fernando, Calif.; Hahnemann Medical College and Hospital, Chicago, 1902; formerly member of the city council of Los Angeles; served during the World War; aged 66; died, January 23, in the Good Samaritan Hospital, Los Angeles, of carcinoma.

John Joseph Brownson ✠ Dubuque, Iowa; State University of Iowa College of Medicine, Iowa City, 1886; member of the board of education; for many years county physician; formerly on the staff of the Mercy Hospital; aged 81; died, January 29, of myocarditis.

Abraham Herman Barr ✠ Linden, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1911; on the staffs of the Alexian Brothers' Hospital and St. Elizabeth Hospital, Elizabeth; aged 51; died, January 1, of coronary thrombosis.

Grant A. Neal, Alabama, N. Y.; University of Buffalo School of Medicine, 1893; for many years health officer of the town of Alabama and at one time county coroner; aged 69; died, January 7, in the Batavia (N. Y.) Hospital, of lobar pneumonia.

Robert Rodgers, Atlantic City, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1889; at one time member of the city council and board of education of Philadelphia; aged 74; died, January 4, of chronic myocarditis and nephritis.

Isaac David Wood, Sylacauga, Ala.; University of the South Medical Department, Sewanee, Tenn., 1901; member of the Medical Association of the State of Alabama; on the staff of the Sylacauga Hospital; aged 63; died, January 30, of pneumonia.

James Roy Beaver ✠ West Pittston, Pa.; Medico-Chirurgical College of Philadelphia, 1911; at one time medical director of the public schools; aged 49; on the staff of the Pittston Hospital, where he died, January 16, of ruptured duodenal ulcer.

Noah Bunyan Adams, Murphy, N. C.; Tennessee Medical College, Knoxville, 1896; member of the Medical Society of the State of North Carolina; served during the World War; aged 69; died, January 20, of arteriosclerosis and hypertension.

Myron Scott King ✠ Boulder, Colo.; College of Medical Evangelists, Los Angeles, 1925; aged 47; on the staff of the Boulder-Colorado Sanitarium and Hospital, where he died, January 4, of acute dilatation of the heart, following pneumonia.

Frederick Harris Morse, Boston; University of the City of New York Medical Department, New York, 1881; member of the Massachusetts Medical Society; aged 81; died, January 14, in Wollaston, of arteriosclerotic heart disease.

James I. Campbell, Norwood, N. C. (licensed in North Carolina in 1898); member of the Medical Society of the State of North Carolina; aged 63; died, January 15, at Charlotte, of a self-inflicted wound of the jugular vein.

110
938

Francis Ashbell Pomeroy, Cheney, Wash.; Long Island College Hospital, Brooklyn, 1883; formerly mayor and member of the school board; aged 89; died, January 31, in Tacoma, of hypertrophy of the prostate and uremia.

Charles Depew Ver Nooy ✠ Cortland, N. Y.; Syracuse University College of Medicine, 1892; part owner of the Cortland Sanitarium; president of the board of education; aged 69; died, January 20, of coronary occlusion.

Martha J. Short Wright, Rolla, Mo.; Ensworth Medical College, St. Joseph, 1892; member of the Missouri State Medical Association; aged 76; died, January 10, of a spinal injury received in a fall twelve years ago.

Joseph Thomas Slattery, Dunlap, Iowa; John A. Creighton Medical College, Omaha, 1909; member of the Iowa State Medical Society; served during the World War; aged 57; died, January 1, of mitral insufficiency.

Robert Ellsworth Wells ✠ Nashport, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1907; served during the World War; aged 52; died, January 3, of a self-inflicted bullet wound.

William George Raymond Jotcham, Minna, Nigeria, Africa; McGill University Faculty of Medicine, Montreal, Que., Canada, 1935; a medical missionary; aged 25; died, January 10, of cerebrospinal meningitis.

Albert William Tiedeman ✠ Baker, Ore.; University of Oregon Medical School, Portland, 1914; member of the school board; on the staff of St. Elizabeth Hospital; aged 53; died, January 3, of angina pectoris.

Eugene Walker Hart, Dadeville, Ala.; Baltimore University School of Medicine, 1891; member of the Medical Association of the State of Alabama; aged 74; died, January 27, of chronic cardiorenal disease.

Henry Jacques Ravold ✠ St. Joseph, Mo.; Homeopathic Medical College of Missouri, St. Louis, 1886; member of the Radiological Society of North America; aged 74; died, in January, of coronary occlusion.

Walter George Gonzales, Hoboken, N. J.; Georgetown University School of Medicine, Washington, D. C., 1925; on the staff of St. Mary's Hospital; aged 38; died, January 17, of lobar pneumonia.

Lake Lewis Starkey ✠ Harlingen, Texas; Birmingham (Ala.) Medical College, 1902; on the staff of the Valley Baptist Hospital; aged 61; died, January 2, of injuries received in an automobile accident.

William Ernest Nelson, Westmount, Que., Canada; McGill University Faculty of Medicine, Montreal, 1903; served during the World War; aged 56; died, January 13, in the Montreal General Hospital.

William John O'Donnell ✠ Buffalo; Niagara University Medical Department, Buffalo, 1897; on the staff of the Providence Retreat; aged 63; died, January 7, of acute appendicitis and septicemia.

Braxton Bragg Pugh, Uniontown, Ala.; Medical College of Alabama, Mobile, 1889; member of the Medical Association of the State of Alabama; aged 73; died, January 20, of coronary thrombosis.

Calvin O. Sones, Morrison, Ill.; State University of Iowa College of Medicine, Iowa City, 1886; member of the Iowa State Medical Society; aged 84; died, January 12, of coronary thrombosis.

Ralph Lemen Taylor, Long Beach, Calif.; University of Denver Medical Department, 1893; formerly city health officer of Long Beach; aged 66; died, January 8, of cardiac decompensation.

John Decard Hall, Chavies, Ala.; Southern Medical College, Atlanta, Ga., 1892; aged 69; died, January 31, in the Erlanger Hospital, Chattanooga, Tenn., of carcinoma of the prostate.

John C. Scott, Lebanon, Mo.; Indiana College of Medicine and Midwifery, Indianapolis, 1888; member of the Missouri State Medical Association; aged 66; died, in January, of pneumonia.

John W. Wood, Boiling Springs, N. C.; Louisville (Ky.) Medical College, 1892; member of the Medical Society of the State of North Carolina; aged 66; died, January 15, of pneumonia.

Joshua B. Thurman, Atlanta, Ga.; Bellevue Hospital Medical College, New York, 1886; aged 79; died, January 31, of shock, following prostatic resection for adenoma of the prostate.

Silas T. Richman, Columbus, Ind.; Medical College of Indiana, Indianapolis, 1883; Northwestern University Medical School, Chicago, 1899; aged 85; died, January 3, of uremia.

J. Leonard Lucas, Edwards, Miss.; Meharry Medical College, Nashville, Tenn., 1906; aged 52; died, January 23, of septicemia with stricture of the urethra and urinary obstruction.

George Wellington Good, Berwyn, Ill.; Jenner Medical College, Chicago, 1908; at one time postmaster of Lavergne; aged 69; died, January 10, of chronic myocarditis and nephritis.

Jean Jacques Lamontagne, Montreal, Que., Canada; University of Montreal Faculty of Medicine, Montreal, 1932; on the staff of St. Luke's Hospital; aged 28; died, Dec. 23, 1937.

Joseph Keefer Fisher, Sunbury, Pa.; Temple University School of Medicine, Philadelphia, 1920; formerly county coroner; aged 41; died, January 29, of pulmonary tuberculosis.

George S. Townsend, Sixlakes, Mich. (licensed in Michigan in 1900); for many years member of the school board; aged 90; died, January 12, of uremia and arteriosclerosis.

Samuel Henry Roberts, Skillman, N. J.; Cornell University Medical College, New York, 1936; aged 27; died, January 29, of an overdose of phenobarbital, self administered.

William Henry Hanchette, Los Angeles; Chicago Homeopathic Medical College, 1879; aged 84; died, January 15, in a hospital at San Pedro, of carcinoma of the prostate.

Philemon Roy ✠ St. Paul; Drake University Medical Department, Des Moines, Iowa, 1896; aged 68; died, January 21, at McAllen, Texas, of coronary thrombosis.

Curtis Albert Tucker, Springfield, Mo.; American Medical College, St. Louis, 1903; served during the World War; aged 65; died, January 3, of coronary thrombosis.

Walter N. Sherman, Pasadena, Calif.; Indiana Medical College, Indianapolis, 1875, aged 83; died, January 15, in the Las Encinas Sanitarium, of chronic myocarditis.

William Albert Smith, Wichita, Kan.; Medical College of Ohio, Cincinnati, 1897; aged 65; died, January 31, of obstructive jaundice and carcinoma of the pancreas.

John J. Arberry, San Francisco; University of Louisville (Ky.) Medical Department, 1891; aged 74; died, Dec. 19, 1937, of hemiplegia and cerebral arteriosclerosis.

Hall Vestal, Richmond, Calif.; Cooper Medical College, San Francisco, 1900; aged 63; died, Dec. 2, 1937, in a hospital at Berkeley, of carcinoma of the bladder.

Richard Andrew Elliott, Avon, Mass.; Long Island College Hospital, Brooklyn, 1896; aged 71; died, January 11, in Boston, of hypertrophy of the prostate.

Charles Edward Chapman, Mobile, Ala.; Medical Department of the University of Alabama, Mobile, 1900; aged 59; died in January of cerebral hemorrhage.

Joseph Francis Schlotterer, Philadelphia; Medico-Chirurgical College of Philadelphia, 1905; aged 56; died, January 5, of chronic myocarditis and nephritis.

T. G. Harriman, Long Beach, Calif.; Northwestern University Medical School, Chicago, 1901; also a lawyer; aged 63; died, January 18, of arteriosclerosis.

Edwin Kendall Richardson, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1895; aged 68; died, January 4, of pneumonia.

Phileas Desmarais, Pascoag, R. I.; School of Medicine and Surgery, Montreal, Que., Canada, 1899; aged 64; died, January 15, in a hospital at Howard.

George Ernest Darrow, Los Angeles; John A. Creighton Medical College, Omaha, 1907; aged 62; died, Dec. 14, 1937, of carcinoma and pneumonia.

Lon W. Pulley ✠ Trinidad, Texas (licensed in Texas under the Act of 1907); aged 62; died, January 1, in a hospital at Dallas, of coronary occlusion.

J. Albert Beauchamp, St. Cesaire, Que., Canada; University of Montreal Faculty of Medicine, Montreal, 1921; aged 42; died, January 14.

Robert H. Peacock, Winter Haven, Fla.; Hahnemann Medical College of Philadelphia, 1881; aged 79; died, Nov. 28, 1937, at Lake City.

Edwin V. Hervey, Indianapolis; Medical College of Indiana, Indianapolis, 1886; aged 86; died, January 16, of cerebral thrombosis.

Frank R. Hill, La Mesa, Calif.; Pulte Medical College, Cincinnati, 1884; aged 81; died, January 9, of cerebral hemorrhage.

V 11
1938

Correspondence

REGULATIONS FOR PREVENTION OF EPIDEMIC DIARRHEA OF THE NEWBORN

To the Editor:—The regulations for conduct of maternity divisions in New York City stated by Dr. William H. Best (THE JOURNAL, April 9, p. 1155) indicate that New York has done an excellent piece of work which should be of value to the rest of the country. The following constructive suggestions concerning the New York rules are offered with the hope that not only New York but also other interested groups will, with equal candor, criticize Chicago's regulations, thereby leading to the formation of the best possible type of procedures.

The New York regulations were established "after numerous conferences with leading obstetricians, pediatricians, representatives of the county medical societies, the Academy of Medicine, and various hospital, medical and nursing groups." The Chicago regulations were established by those groups most interested in this type of work, namely, representatives of the Chicago Medical Society, Chicago Gynecological Society, Chicago Hospital Association, Infant Welfare Society, Chicago Hospital Council, Catholic Hospitals of the Archdiocese of Chicago, American College of Surgeons, Chicago Pediatric Society making up the Joint Maternal Welfare Committee of Cook County, and the Chicago Board of Health. It was the purpose of the group to formulate regulations which they thought would be practical so as not to interfere with the successful conduct of a hospital, and at the same time not so lenient that preventable morbidity and mortality might occur.

Regulations which are satisfactory and reasonable and which are developed by the cooperative effort of interested groups are much more likely to be successfully carried out than those which are arbitrarily set up and enforced.

New York's regulation 1 (*a*) does not provide for the isolation of a mother delivered elsewhere in an institution than in the clean maternity division. For example, a precipitate delivery might occur in a corridor or an unclean operating room. Such a case should be isolated as provided in the Chicago rules.

New York's regulation 1 (*b*) requires that there be two delivery room units, one for normal and one for infected cases. Chicago's regulations permit the delivery in infected cases in a private room, properly equipped, if a second delivery room is not available.

New York's regulation 1 (*c*) would require the delivery room to be on the same floor as the rest of the obstetric division.

Chicago's regulations allow the delivery room to be elsewhere than on the obstetric floor if the patient is properly safeguarded while being moved from the delivery room to the obstetric floor. By so doing, extensive reconstruction of the existing building may be avoided.

New York's regulation 2 (*b*) requires that an isolation nursery be maintained. Chicago's regulations provide that an isolation nursery be maintained and, in addition, that a second clean nursery be available when several cases of diarrhea occur. Thus infected infants may be isolated in one nursery, healthy contacts isolated in a second nursery, and nonexposed and noninfected newborn infants placed in still another nursery. Experience with outbreaks of infection in newborn nurseries has shown that morbidity and mortality are high because of failure to recognize what is occurring and to isolate immediately the infected infants. Furthermore, *contacts also must be isolated.* In our experience, if contact with exposed infants is avoided, outbreaks may be prevented so that closing of the maternity ward is obviated. When a case of diarrhea occurs in an institution, in the interim of deciding whether an epidemic is really starting and whether the maternity service should be closed, it is important that nonexposed newborn infants be kept out of contact with those who have been exposed.

New York's regulation 2 (*a*) requires that every hospital shall have a nursery for the care of premature and immature infants. There are many institutions in which births of premature infants occur no more frequently than once every two or three weeks, if that often. Chicago's regulations permit the care of premature infants in the normal newborn nursery, provided there is adequate specially trained nursing personnel throughout the twenty-four hour period, and satisfactory equipment, which are felt to be the most important factors in the care of premature infants. Chicago's regulations do not require that every hospital have a premature nursery. They permit the transportation of premature infants in a specially constructed incubator ambulance to some central premature station, if the hospital does not wish to have the expense of maintaining a premature nursery.

New York's regulation 2 (*b*) does not require that an infant, delivered elsewhere in an institution than in the clean maternity section, be isolated. Chicago's regulations provide for such isolation, as well as for the isolation of infants exposed to communicable infections, particularly impetigo of the newborn or epidemic diarrhea of the newborn, since such infants may contract the disease and, unless isolated, may expose others.

New York's regulation 2 (*d*) does not require lined bassinets. Chicago's regulations do, to help prevent injury to babies.

New York's regulation 2 (*d*) does not require that when a carrier system is used there be redraping of bassinets before infants are put into them, nor does it specifically require washing of the hands before taking each baby out of the carrier. Chicago's regulations provide for such redraping and hand washing, as well as for arrangements to have one nurse constantly in attendance on the infants in the bassinets on the carrier to prevent contact with visitors or other possible sources of infection.

New York's regulations 2 (*k*) and 4 (*d*) require sterilization of bottles twice, once in the nursery and again in the formula room. Chicago's regulations require that the bottles be cleaned in the nursery and sterilized in the formula room.

New York's regulation 2 (*l*) permits the use of cresol for the cleansing of equipment, such as the stethoscope bowl which comes in contact with the infant's skin. Since burns have resulted in some instances from the use of cresol, Chicago's regulations provide for the use of safe antiseptics only for such purposes.

New York's regulation 4 does not require running water with foot control in the formula room suite. This will make proper hand washing difficult in the formula room. Chicago's regulations require this.

New York's regulation 4 (*c*) does not require that sugar solutions be stored in individual bottles and prepared fresh daily, as is required by the Chicago rules. In epidemics of diarrhea which have occurred in newborn nurseries, in a number of instances it has been found that sugar solutions, dextrose or betalactose, have been stored in bulk and used for the babies. In Chicago nurseries, tests of such solutions stored in bulk have revealed their bacterial count to be exceptionally high.

New York's regulation 6 requires disinfectant solutions to be used after hand washing, but these are not required in Chicago's regulations.

New York's regulation 6 does not specify running water with arm, knee, or foot control devices. Chicago's regulations specify this. Without running water operated in this way, proper and thorough hand washing is not possible.

New York's regulation 7 (*c*) requires scrubbing and the wearing of rubber gloves or the use of forceps to change a nipple on a bottle. The Chicago regulations rely on thorough scrubbing of the hands.

New York's regulation 8 requires that the newborn nursery be under the supervision of the obstetric or of the pediatric

service. The Chicago regulations specifically require that a single physician be in charge of the nursery and responsible for its conduct, which seems more satisfactory from the standpoint of enforcement.

New York's regulation 10 (*a*), to be adequately carried out, would require prostatic examination for all male individuals, and urinary and stool examinations on all personnel on duty in the maternity division. Furthermore, to be of value, such examinations would have to be repeated at monthly intervals. Chicago's regulations require nose and throat cultures, Dick and Schick tests, and examination for focal infections. Attention is focused on infections which might be responsible for outbreaks of disease in the maternity division and nursery, such as tonsillar or sinus infections, and diarrhea, as well as on existing or recent active communicable infection in potential carriers.

New York's regulation 13 (*a*) requires that personnel "shall wash their hands with soap and hot water and immerse them in a suitable disinfectant solution." Chicago's regulations do not require disinfectant solutions but stress thorough hand washing. Disinfectant solutions are not effective for hand sterilization. There are many who believe that when disinfectant solutions are available there is carelessness in hand washing while, if they are not provided, hand washing is more thorough and satisfactory.

New York's regulation 13 (*a*) makes no provision as to the drying of the hands. Chicago's rules require drying on individual towels.

New York's regulation 13 (*b*) requires that physicians visiting mothers in wards wear a face mask, cap and gown. This is not required in the Chicago regulations, since it is felt that it will do little to prevent infections and that it is an unnecessary hardship to wear a mask, cap and gown just to visit a patient.

New York's regulation 13 (*d*) requires a mother to wear a face mask during the time she is breast feeding her baby. By the Chicago regulations, the mother is required to wear a mask only when she has an infection of the upper part of the respiratory tract.

New York's regulation 14 (*a*) requires that a minimum of visiting be permitted, but no statement is made concerning what is considered a minimum of visiting. The Chicago regulations specifically permit two visitors a day, exclusive of the husband.

The Chicago regulations require each hospital to establish its own adequate obstetric staff and requirements for the calling of consultations, and for the conduct of maternity divisions which will prohibit the abuse of oxytocics, analgesics and operative procedures during deliveries. It is hoped that these regulations will aid in reducing the number of deaths from cerebral hemorrhage, asphyxia, and prematurity. The New York regulations do not require these things.

The Chicago regulations will tend to prevent not only gastrointestinal infections but all infections of the newborn and will tend to protect the mother, fetus, and newborn from many disasters other than those due to infectious agents.

HERMAN N. BUNDESEN, M.D., Chicago.
President, Board of Health.

BENZEDRINE SULFATE—A WARNING

To the Editor:—I cannot refrain from saying a word of approval with regard to your editorial on "Benzedrine Sulfate—A Warning." I am a neurasthenic doctor 65 years of age and when some months ago a sample of benzedrine sulfate fell into my hands with the accompanying literature I had to try it. It worked like a charm; if I got up in the morning feeling somewhat dragged out and took a tablet of benzedrine sulfate I felt pretty well all day and could do my work without tiring; the result was that I took it almost daily. Before very long I got so I couldn't sleep and couldn't eat. I have never been much of an eater but could eat reasonably well. It never occurred to me that the benzedrine sulfate could be at the bottom of it and I had a gastrointestinal series run and a rectal examination made; it finally dawned on me that the benzedrine sulfate had something to do with it and I promptly stopped it. I can now sleep pretty well but have not as yet recovered my appetite. I am glad once more to confirm the wisdom and the conservative attitude of THE JOURNAL.

DONALD MACLEAN, M.D., Reno, Nev.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

ANESTHESIA FOR DELIVERY IN HOME

To the Editor:—What type of anesthesia would be best to use for delivery in the home in a rural community? Please give information as to dosage, method of administration, time for giving, length of time that it is effective, and any other helpful information. M.D., California.

ANSWER.—Satisfactory and safe analgesia in labor, particularly for patients to be delivered in the home, is as yet not available. It must be realized that analgesic drugs of all kinds are likely to add to the complications of labor and delivery. Undoubtedly, some form of analgesia must be used in the majority of cases. It is thus necessary to acquaint oneself with one method, to learn its limitations and the complications that are likely to result from its use and to be prepared to meet these when they occur.

Morphine and scopolamine properly administered probably offer the safest analgesia for the patient to be confined in her home. In the usual primiparous labor morphine from 0.01 to 0.016 Gm. (one-sixth to one-fourth grain) and scopolamine from 0.00025 to 0.0005 Gm. ($\frac{1}{260}$ to $\frac{1}{130}$ grain) can be given when the cervix is completely effaced and dilated sufficiently to admit two or three fingers (from 3 to 4 cm.). In the large majority of cases this will be sufficient to carry the patient to the end of the first stage of labor. Some form of inhalation anesthetic, usually ether, can be used during the second stage. It is rarely advisable to repeat these drugs unless the labor is unusually prolonged, in which case a much smaller dose should be used. It has been the experience of some that scopolamine in ampules is more efficacious than the tablets.

The only serious complication that may result from the use of these drugs is morphine narcosis of the baby. This is more likely to occur when the drug is administered less than four hours before the birth of the child. It is likewise more apt to occur following a difficult delivery or in the event that the baby is premature. It is most important to learn how to resuscitate asphyxiated babies. The simplest and most effective procedure is to clear the air passages by means of a hard rubber catheter and to carry on respiration artificially by means of this catheter until breathing has been well established. The baby should be kept warm during the process of resuscitation. If these measures are carried out, no baby need be lost as a result of the analgesia administered to the mother (Shute, Evan, and Davis, M. E.: The Effect on the Infant of Morphine Administered in Labor, *Surg., Gynec. & Obst.* **57**:727 [Dec.] 1933).

VITAL STATISTICS

To the Editor:—What do the figures on vital statistics mean? When a death rate is given, does that refer to the number of deaths from a given disease according to the whole population of the town at the time of the report, or does it refer to the number of deaths according to the incidence of the disease? M.D., New York.

ANSWER.—The death rate of a city is the number of deaths divided by the population. It is usually expressed per thousand or per hundred thousand persons, is frequently on an annual basis, may be for specific population groups (by age, sex or color) and may or may not be by diagnosis. The other rate referred to (the proportion of cases which terminated fatally) is customarily termed a "case fatality rate," not a "death rate."

V 11
1938

POSSIBLE CAUSES OF RECURRING ITCHING AND SWELLING FEET

To the Editor:—A white man, aged 45, for the past three years has been having a periodic recurrence of swelling and itching of the feet. At regular intervals of about three weeks he notices intense itching on the plantar surface of the left foot, which spreads over the entire surface and at the same time the foot swells, gradually reaching about twice the normal size. The swelling is firm and boardlike. The swelling and itching reach a maximum in about forty to sixty hours and subside rapidly in from six to ten hours. There is no redness and apparently no thermal disturbance locally. There is a systemic reaction consisting of a rise of temperature to 100 or 100.2 F., loss of appetite, general aching and malaise. Between attacks he feels fine in every way. The patient served twelve years in the United States Navy prior to 1931. Most of this time was spent in the tropics. There has been no serious illness previous to the present condition. Seasons of the year and geographic locations have no effect on the severity or periodicity. Repeated examinations reveal nothing abnormal, including the blood count, condition of the heart, blood pressure, lungs and prostate and x-ray examination of the gallbladder and the gastro-intestinal tract. I would appreciate any information on the nature of this condition or any suggestions regarding further study.

M.D., Missouri.

ANSWER.—The paucity of symptoms makes diagnosis difficult and necessitates the consideration of diagnoses that seem remote possibilities. The swelling of the foot suggests (1) local interference with blood or lymph circulation, (2) local infection or (3) general infection with local manifestations.

The regularity of the attacks and the absence of local pain, tenderness and redness make it difficult to ascribe the swelling to recurrent attacks of phlebitis of the deep veins. Intrapelvic interference with circulation seems also unlikely; but the pelvis should be examined carefully for anything that might cause mechanical obstruction, and a Frei test for venereal lymphogranuloma should be made.

In the temperate zone by far the commonest cause of periodic swelling of the foot and leg is the erysipelas-like infection, said by some to be due to the Fehleisen streptococcus, which causes elephantiasis. The inflammatory attacks come on at irregular intervals and soon lead to permanent enlargement.

Infection with a filaria is supposed to be the common cause of elephantiasis in the tropics, though there are some who dispute this. Like the form seen in the temperate zone, the attacks of fever and inflammation occur at irregular intervals and soon lead to permanent enlargement, attaining immense dimensions in many cases. In spite of these objections, the blood of the patient should be examined for filaria during one of the febrile attacks.

Undulant fever and malaria, when mild, are so variable in their manifestations that they come under suspicion. Three years is a long course for undulant fever and the three year interval betwen the return of the patient from the tropics and the onset of the present trouble seems a long period of latency for malaria, yet the blood should be examined for plasmodia during a febrile paroxysm. The intradermal test and Huddleson antigen agglutination test for undulant fever also should be made. The differential white count should be studied with these possibilities in mind. Both cause a leukopenia with relative increases of the mononuclear cells; but in undulant fever the lymphocytes are increased, while in malaria the relative increase is in the large mononuclears.

Finally, it is a good rule to think of syphilis, regardless of the difficulty of explaining the symptoms in accordance with the usual manifestations of the disease. Hepatic syphilis is known to cause periodic febrile attacks. This possibility should be investigated.

DANGERS FROM BURNING MOTION PICTURE FILMS

To the Editor:—If a motion picture film ignites while the operator is showing it, what other dangers are present aside from the flames, i. e., poisonous gases. What precautions can be taken?

M.D., Wyoming.

ANSWER.—Poisonous gases likely to arise in connection with the burning of motion picture films are the oxides of nitrogen, if cellulose nitrate films are used, and carbon monoxide. The so-called safety films are believed to be cellulose acetate. In addition there may arise some carbon dioxide and in the case of the acetate films gases of complex nature are derived from the acetate component. Most states and cities require boothing for housing motion picture operations, particularly if the machines are located in the same rooms occupied by public audiences. This is especially true if the films used are of the cellulose nitrate variety. These booths, while serving the interests of the audience, may increase the exposure for the operator, since the gases created are confined to small spaces. By way of protection, the following is suggested: 1. The booths, particularly if small, should be exhausted in order to remove excessive heat under normal conditions and to aid in the removal of injurious gases in the event of fire. 2. Fire extinguishers should be available, but it is to be remembered that the carbon tetrachloride type of fire extinguishers may lead to dangerous carbon tetrachloride vapors. Further, there is some belief that carbon tetrachloride in contact with highly heated surfaces may lead to the formation of phosgene, which is of course highly toxic and dangerous. 3. Emergency respirators are available through purchase, which should be worn by operators when confronted with a fire emergency. 4. Under some, but not necessarily all, circumstances a sprinkler head system or analogous equipment may be called for, either by law or by good practice for the combating of this type of fire.

BITING LIPS AND CHEEKS

To the Editor:—I have had a lifelong habit of biting the lips and cheeks and stripping off the mucous membrane. What can be done to prevent this? Would it be safe to put a clip of some sort over a tooth so as to prevent complete occlusion? Is there such a device on the market? If so, where should I inquire for it?

M.D., New Jersey.

ANSWER.—The habit of biting the lips and cheek is decidedly dangerous and should not be allowed to continue. The continuous irritation produced in this way may set up serious pathologic conditions. The first step in the consideration of such a case should be the construction of accurate plaster or stone models made from plaster impressions of the dentures. A careful study of these may show conditions that invite the execution of the habit. Judicious grinding of the teeth may make the execution of the habit difficult enough to effect a cure.

Such lip and cheek biting is often to be considered as a nervous habit and should be corrected under the advice of a neurologist. Such habits are unconsciously executed and sometimes they can be cured by consciously executing them before a mirror regularly every day for a time, the object being to bring the muscles and nerve tracts involved in the execution of the habit under conscious control and thereby breaking up the unconscious execution. If no other method is available, probably removable appliances should be made that can be worn on the teeth so as to make the execution of the habit impossible. These could be made only for the individual patient and by a skilful dentist. They should be used only as a means of breaking the habit.

MANAGEMENT OF MYOPIA

To the Editor:—A patient was discovered to have pronounced myopia of the left eye at the age of 4, so that normal vision (20/20) could be obtained by a lens —13D. The right eye was normal. This patient never had binocular vision and still almost exclusively uses her right eye. She wore eyeglasses on the advice of an eye specialist and the strength of the lens of the left eye was gradually worked up to —13. In the meantime the right eye became myopic and last year the correction for the right eye was —1.5 (the patient is now 13 years old). At present the eye specialist has prescribed the lens —3. He insists that she shall always use her glasses for far and near work and is of the opinion that she must always have eyeglasses to obtain vision 20/20 in each eye. When I expressed my fear that the strain of accommodation in near work would aggravate the myopia, he told me that if she should not use the eyeglasses and should do her work without using much accommodation, her eye muscles would become atrophied. Now another eye specialist has examined the patient and tells me that: 1. She should not have had any correction for the left (myopic) eye. This eye would not become atrophied from lack of use as the previous specialist told me. The correction of this eye tended to make the right eye myopic. 2. The patient should have as little correction of vision as possible for comfortable street use. She should do most of her writing and reading without the eyeglasses. 3. Her eye muscles would not become appreciably atrophied and her myopia would not progress or would progress much slower if she should follow this advice. Please advise me as to what course the patient should follow and whether the opposing advice is due to a difference of personal opinion of these two eye specialists or whether there are two different schools in ophthalmology with opposite approaches to guiding a case of myopia.

M.D., New York.

ANSWER.—This case exhibits an essential difference of opinion between ophthalmologists with reference to several points about myopia. First, one would agree with the physician who prescribed correction for the eye with high myopia in infancy. While it is not certain that the vision would have deteriorated at this age if the correction had not been prescribed, an eye that is uncorrected is probably more liable to develop convergent or divergent squint than if it is corrected. Many ophthalmologists might not agree with him, however, that the patient must use the full correction for both eyes at all times for fear the eye muscles will become atrophied. On the other hand, there is no evidence that the myopia will become aggravated by wearing this correction. In other words, it would probably be advisable that the full correction be worn a considerable part of the time, especially if the patient does not notice any discomfort on close work. If discomfort is noticed

110
938

on close work the correction may be cut down or the patient may go without glasses for this purpose alone without harmful effect. It is not likely that wearing or going without the glasses will have any effect on the progress of the myopia, which will proceed to a certain point in any case and then stop. Conceivably a large number of ophthalmologists might disagree with the opinion here expressed; the answer can only reflect what seems to be a sound point of view.

POSSIBLE SYMPTOMS FROM COPAVIN

To the Editor:—The preparation copavin-Lilly, used for the treatment of common colds, has been written up several times in THE JOURNAL. Each capsule is said to contain one-fourth grain (0.016 Gm.) of papaverine and one-fourth grain of codeine. Several patients taking one capsule every two hours (five in twenty-four hours) have complained of nausea without vomiting, which discomfort was relieved after discontinuance of the treatment, and of being dizzy and light headed, from which condition relief is obtained soon after treatment is discontinued. In a clinic the percentage of cases showing either symptom or both is less than 1. Two months ago a husky man with a forty-eight hour old common cold was given copavin. After two or three doses he became nauseated but did not vomit. The medicine was stopped. The next day the nausea continued and another doctor reports that he is still suffering from the effects of the treatment (although neither he nor the patient knows what drugs were originally prescribed). The man lost three days from his work immediately after the nausea began. Have you had similar complaints and inquiries? Can either papaverine or codeine or the combination cause nausea that could require treatment for two months after the administration of copavin? My own interpretation is that he had a "cold" not limited to the upper respiratory tract but involving the gastro-intestinal tract, and the nausea may have developed in spite of medication. Will you kindly advise me?

M.D., New York.

ANSWER.—Copavin is the proprietary name under which Eli Lilly markets under license of the University of Minnesota a mixture of codeine sulfate and papaverine hydrochloride.

Codeine is rapidly absorbed from the bowel and rapidly excreted to the extent of 80 per cent or more in the urine. Although codeine has only a slight tendency to cause digestive derangements, cases have been reported in which single doses of from 100 to 200 mg. (from 1½ to 3 grains) have caused marked nausea. The presence of papaverine, which is not known to produce nausea in therapeutic doses of from 30 to 60 mg. (one-half to 1 grain), may potentiate the action of codeine.

The patient received from 30 to 45 mg. (one-half to three-fourths grain) of each of the drugs. In very susceptible individuals this could cause nausea, but owing to the rapid elimination of the drugs (assuming no impaired kidney function) it is a perfectly sound assumption that the continued nausea is not due to the codeine phosphate-papaverine hydrochloride mixture administered two months previously.

ATTACKS OF APNEA IN INFANT

To the Editor:—A boy, aged 22 months, has been subject to attacks of complete cessation of breathing since returning home from the hospital following a normal delivery. The duration of the attacks has tended to decrease. A variety of causes will bring on an attack, such as crying, falling and hurting himself, or being undressed for an examination by the doctor. An attack begins by his taking a deep breath and holding it. During the period of absent breathing the child lies very quiet although occasionally he will move his limbs. He becomes cyanotic. Then he takes a deep breath, lies quiet again as if unconscious, with shallow breathing, and frequently micturates and defecates. Then he takes another very deep breath, begins to cry or goes on with his play, although very pale for an hour after. He appears very tired after such an episode. The attacks may occur several times a day or be absent for a week. Their duration is from a few seconds to a full minute. At birth he weighed 5 pounds 2½ ounces (2,340 Gm.). At 22 months he weighs 22 pounds (10 Kg.). He is small for his age but his body is well proportioned. Development has been normal. He was slow in learning to sit and walk but was within normal limits. His intelligence is normal. A consultant discovered a soft apical systolic murmur but I have been unable to confirm this. The child is subject to colds, during which wheezing breath sounds can be heard. Examination is otherwise negative. The family history is negative. Please comment on diagnosis, prognosis and treatment.

M.D., New York.

ANSWER.—The case offers an interesting diagnostic problem. The episodes are strongly suggestive of breath holding. The early onset is a point against this, but the spells described are characteristic of this disorder. Other conditions that must be considered here are: 1. Congenital heart disease, though the lack of constancy of the murmur described would make this diagnosis questionable; however, an x-ray examination should be made of the heart, which would at the same time also show the size of the thymus. 2. Hypoglycemia, which not infrequently results in spells simulating the signs described and the careful study of the diet and the blood sugar are indicated. 3. Tetany. Blood calcium determinations should be made at the same time that the tests for hypoglycemia are made. A dextrose tolerance test would also be of value in considering the possibility of hypoglycemia. 4. The possibility of an old birth hemorrhage affecting the respiratory center or similar changes resulting in minor epileptic attacks. There should be some more definite neurologic signs if this is a factor. Since no definite diagnosis can be made from the symptoms presented, the treatment must be expectant, and the result will depend on the underlying cause of the clinical manifestations. In view of the uncertainty of the cause, the prognosis had best be guarded. If the child is a breath holder, the prognosis is good but any of the other possibilities might not be so favorable. There is no medical therapy for breath holding. The prognosis is excellent and the condition usually disappears after the second year.

INTERSTITIAL KERATITIS

To the Editor:—A man, aged 23, came under my care on July 13, 1937, for treatment of an acute inflammatory condition of the cornea of his right eye, characterized by a flakelike cloudiness of the nasal third and involving the deeper layers. The corneal epithelium was intact and there was no vascularization at this time, but as the cloudiness advanced to involve the whole cornea a few deep blood vessels were seen to grow in from the limbus. The vascularization was of a broom type, and cells were observed in the anterior chamber. Vision was reduced consistently with the edema of the cornea. A search for foci revealed a four plus Wassermann reaction. There were no other foci. History disclosed that the father has been under antisyphilitic treatment within the last few years, as the result of a coincidental finding of a positive blood Wassermann reaction. A diagnosis of acute interstitial keratitis of syphilitic orgin was made on the history, serologic tests and character of the lesion. The patient was immediately treated with intramuscular injections of a bismuth compound supplemented by silver arsphenamine intravenously along with local treatment to the eye, consisting of yellow mercuric oxide, atropine and heat. This eye responded quite well to treatment and at the end of two months his vision was normal and the only evidence of the disease is a few flakelike opacities visible under the slit lamp and two or three short deep blood vessels protruding 5 mm. in from the limbus. The center of the cornea was not vascularized. At about the time the right eye had cleared, in spite of treatment, the left eye showed a similar cloudiness of the cornea at the temporal limbus and there is one deep blood vessel growing in at this stage. There are a few cells in the anterior chamber. The cloudiness is advancing at each subsequent visit to my office. I have thought of giving intravenous typhoid therapy but I have not started it. The second eye has now been involved for four days and the cloudiness has extended about 4 mm. from the temporal limbus. Will you kindly offer this for the opinions of other ophthalmologists? I shall appreciate their recommendations. I should also like to know how frequently the second eye is involved in cases in which intensive antisyphilitic treatment has been given over a two months period prior to its inception in the other eye. Please omit name.

M.D., New York.

ANSWER.—Interstitial keratitis is, as in this case, almost always bilateral. Involvement of the second eye may occasionally be prevented by energetic antisyphilitic treatment, begun while the process is still unilateral. In view of the fact that the right eye in this patient has cleared almost completely and that the present involvement of the left eye is apparently minimal, it seems likely that a continuation of energetic combined antisyphilitic treatment with an arsphenamine, bismuth compound and potassium iodide will clear up the process completely in both eyes.

Interstitial keratitis differs from all other inflammatory lesions of syphilis in the extreme slowness with which it responds to chemotherapeutic treatment. The subsidence of the acute inflammatory reaction usually takes six weeks or longer. The duration of healing may be lessened and the possibility of complete healing very much enhanced by means of combined nonspecific treatment and chemotherapy. The best procedure would be induced malaria followed by energetic chemotherapy. Failing this, intravenous injections of typhoid vaccine, sufficient in dosage to produce a temperature of from 103 to 105 F., may be actually combined with chemotherapy, the arsenical injection being given at the height of the fever.

CONVULSIONS DURING ANESTHESIA

To the Editor:—What is known concerning convulsions during ether anesthesia? Is there any adequate therapy for such a condition? Also I should appreciate a few references on the subject.

M.D., New York.

ANSWER.—The literature concerning convulsions during anesthesia has been presented in considerable detail by Lundy (Convulsions Associated with General Anesthesia, *Surgery* **1**:666 [May] 1937). This article included a complete bibliography on the subject. Another article (Lundy, J. S., and Tuohy, E. B.: General Anesthesia Complicated by Convulsions, THE JOURNAL, March 20, 1937, p. 971) was practically an abstract of the article in *Surgery*, without, however, the tabulated information concerning the 150 cases that were considered there.

An informing article on this subject was one by E. C. Rosenow and R. M. Tovell (Etiology of Muscular Spasms During General Anesthesia, *Am. J. Surg.* **34**:474 [Dec.] 1936).

The therapy for the condition, at present, is the use of an antispasmodic. For this purpose the soluble barbiturates given intravenously are the first to come to mind and without doubt are the best and most available ones. It should be possible, and often is, to control the convulsions until the effect of the anesthetic wears off, and it should be possible even for days if necessary, as is possible in treating tetanus, until the disease has run its course.

Doubtless the authors will be glad to furnish reprints of the articles referred to.

FEMALE GENITAL HYPOPLASIA AND PREGNANCY

To the Editor:—A woman, aged 25, has been married six years and has had no pregnancies. She is desirous of becoming pregnant. Menstruation began at 14 but has never been regular since its onset. She has gone without a period for as long as a year. Her last menstrual flow was the third week in February; previous to that it occurred in December 1936. Two weeks before onset, she complains of severe cramping in the lower right quadrant. The breasts are rather large and pendulous and do not contain any masses. There is slight tenderness over the lower right quadrant of the abdomen. The cervix is smooth and small and there is a very slight erosion. The uterus is of infantile type, anteflexed and freely movable. The right ovary is twice the normal size, slightly tender and freely movable. The left ovary is normal. The thyroid is normal. In 1934 she was given intravenously antuitrin-S 0.04 cc. daily for five days and one theelol capsule three times a day. This treatment was followed only two months. Since she came under my care I have given her for three months follutein 1 cc. intramuscularly three times a week for two weeks, followed by intramuscular theelin in oil 1 cc. five times a week the third week in the month, with a week of rest. During the third week she also takes two hormotone tablets three times a day. She has not as yet had a menstrual period. I am interested in establishing a menstrual cycle, with a later possibility of pregnancy. I would appreciate a suggestion of a plan of treatment to establish a cycle. M.D., Texas.

ANSWER.—This patient's fundamental trouble is undoubtedly a female genital hypoplasia dating from puberty, and the results now show themselves in the form of functional derangements —evident disturbances of menstruation, and probably also a considerable degree of infertility. It is doubtful whether much can be done in such cases at the age of 25, since by that time the growth impulse and the developmental urge have been lost.

Within certain limits, it is a rational procedure to use endocrine preparations as a remedy for amenorrhea and oligomenorrhea. In this particular case such treatment seems to have been unavailing.

The first step in the management of the case should be a complete examination with reference to medical and endocrinologic factors. Not uncommonly one finds a thyroid deficiency, even though the patient presents none of the classic signs of myxedema. For that reason repeated determinations of the basal metabolic rate are indicated.

As a last resort one might try light irradiation of the ovaries, a procedure the technic and results of which are described by Jarcho (Gynecological Roentgenology, 1931).

ALUMINUM HYDROXIDE AND KAOLIN ENEMA

To the Editor:—Will you please clarify the article by Drs. Eyerly and Brenhaus in THE JOURNAL, July 17, 1937, on these points: 1. The relative proportions or amounts of aluminum hydroxide and kaolin in 3 ounces of water for an enema. 2. The technic of rectal administration of this thick suspension. L. L. CORCORAN, M.D., Rock Rapids, Iowa.

ANSWER.—The preparation is a pure colloidal suspension of 3 per cent aluminum hydroxide and 15 per cent of kaolin. This mixture is used with an equal amount of warm, distilled water. No difficulty is experienced in injecting this, and a small rectal tube or rubber catheter is used for the administration.

BREATH SOUNDS OVER ABDOMEN

To the Editor:—What is the origin of breath sounds easily heard with a stethoscope over the abdomen in a patient dying from hemorrhage? M.D., New York.

ANSWER.—Breath sounds may be heard with the stethoscope over the abdomen in many normal healthy persons when the subject of the investigation indulges in forced breathing with the mouth open. It is assumed that the phenomenon is produced by the transmission of tracheal sounds along the vertebral column into the abdomen, although there is no proof to substantiate this assumption. A patient dying from hemorrhage is usually "gasping for breath." That is to say, he is indulging in forced breathing with mouth open. There appears to be no other reason why the breath sounds may be heard over the abdomen in such a patient.

Council on Medical Education and Hospitals

ANNUAL CONGRESS ON MEDICAL EDUCATION AND LICENSURE

Thirty-Fourth Annual Meeting, held in Chicago, Feb. 14 and 15, 1938

(Continued from page 1217)

DR. J. W. BOWERS, Fort Wayne, Ind., in the Chair

JOINT SESSION OF THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS AND THE FEDERATION OF STATE MEDICAL BOARDS

FEBRUARY 15—MORNING

Hospital Internships as a Requirement for State Registration

DR. WINFORD H. SMITH, Baltimore: I addressed a letter to a number of hospitals and asked the following questions: 1. Are the internships in your hospital rotating in type? 2. Do you believe that the rotating internship is the most valuable type to the individual? 3. Do you think this type of internship should be the only type recognized by state boards of licensure? 4. Please discuss any phases of this problem which occur to you. The answers received indicate clearly that there is a large body of opinion definitely opposed to the present demands of boards of licensure in some states. It may be said that these boards are merely carrying out the law and that in many instances the present boards are not responsible for the law. That is undoubtedly true, but it is also probably true that in some states those boards have some discretion in the matter and could be more liberal than they are. Furthermore, the board of licensure is probably the best body to undertake to bring about a change in the law where a change is desirable.

Hospitals owe a duty to the public to provide the best type of service to their patients. That is their main function. The requirement of a fifth, or intern, year indicates that in some states it is felt that a four year course in medicine is not sufficient to fit a man to practice medicine. Why make the hospital responsible for completing his training by methods which result in sacrificing the type of organization which is for the best interest of the patients? Should the aim be solely the training of general practitioners? If so, then the requirement should be a two year rotating service, at least, for a one year rotating service will not yield the result desired. We must recognize that many graduates intend to specialize. Is it not desirable, therefore, to recognize types of intern service which promote such training to the fullest degree? There are many competent authorities who feel that it is desirable. It is my opinion that boards of licensure might better decide what hospitals are capable of giving interns an experience of sufficient value to qualify them for registration, recognizing that this may be accomplished by various types of service.

I recognize that it is necessary to require a rotating service in some hospitals, perhaps in the majority of hospitals, because the majority of general hospitals are too small to offer any other type of internship which would be worth while. I do not claim that the straight service is the only type that should be recognized. Each type has its place. A straight service internship in a teaching hospital of one year's duration of the sort I have in mind is a more valuable experience than a one year rotating internship in a small hospital of the nonteaching variety. An exposure to four or five different fields of medical work for a period of from two to three months each does not of itself offset the advantages which straight service internships in teaching hospitals enjoy. I believe that men trained for twelve months on a straight service, under conditions I have outlined, are safer men than one who has had a hodgepodge experience with a little of everything and not much of anything. I plead for a more liberal attitude by boards of licensure in recognizing that no one type of internship possesses all the virtues desired

and that other factors than type of internship should be considered in determining a man's fitness for examination and registration.

The rigid exclusion from the licensing examinations of applicants who have not had a rotating internship will in the long run deprive the state of some of the best medical talent that would otherwise have been attracted to it. The reasons for this statement are as follows: It is my belief that medical students prefer teaching hospitals for internships, as a rule. They will seek such internships regardless of whether or not they are rotating in character. This means that in general the teaching hospitals have the pick of the graduating classes and they naturally take the best men. Since most of the teaching hospitals are straight service hospitals, it follows that on the whole the best men presenting themselves for licensure in any one year will be those who have had straight service internships.

DISCUSSION

DR. FREDERIC A. WASHBURN, Boston: A study of the medical licensure statistics published in THE JOURNAL April 24, 1937, shows that, in nineteen states, medical licensing boards require that a candidate should have an internship experience before they will examine him for licensure. In some states which require an internship the position that a rotating service be required has been taken by their boards of registration. In New Jersey the law reads that the candidate must have served at least one year in a hospital approved by the board. The other sixteen states which require an internship have as a rule in their laws a clause similar to that of the New Jersey law. The remaining twenty-nine states make no internship requirements of their candidates for licensure. I am not sure how many states now make the requirement of a rotating internship, but I have been told that the number is eight. That no man is fit to practice medicine who has not intern experience in most of its branches is not in my opinion a sound position. How did it happen that the states which demand a rotating service came to take this stand? I fear that the Council on Medical Education and Hospitals is not blameless. The standards of the Council are high. It has a staff of five engaged in inspecting hospitals approved for intern training. It is doing a remarkably good job in this field. Boards of registration in medicine may well consider that the hospitals which it approves meet all necessary requirements for the training of interns. The teaching hospital with the straight service gets the pick of intern material and gives a training far superior to the one year rotating service of the small hospital, yet several of the most important states in the Union choose the poorer man with the poorer training. The result over a period of time is bound to be a mediocre medical profession in those states. These states are forcing on their own young men who wish to study medicine and desire to settle in their native states the acceptance of inferior hospital training. Those hospitals which feel they must have rotating services should make them two years long at least. The one year service with three or four shifts is bad for the intern and worse for the hospital. Is it possible that these states have in mind forcing the great teaching hospitals to adopt rotating services? I believe that with further study of the subject they will perceive their error and the damage they are doing to their own states and will soon modify their requirements.

DR. IRVIN D. METZGER, Pittsburgh: We have had resurrected today a problem which most of us thought was settled twenty years ago—that of the type of internship best suited to medical graduates. The legal regulations in a score or more states which require internship as a fifth year of medical education and the recommendations of the most discerning evaluating agencies prove conclusively that a rotating type of service is the only one that assures safe and competent general practitioners. Only such qualified persons are of legal concern to state boards. Many of us contended twenty years ago and have had no reason as yet to change our minds that an apprentice type of hospital training in which the recent graduate has had a carefully supervised service in each department of medicine in a minimum of one year's time is the ideal one whether he expects to enter general practice or pursue further studies looking toward a specialty. The ability to survey the needs of any patient and the ability to determine the methods of meeting such needs can be done best by one who has the broader view in medicine and who has no biased trends in any one direction. A narrowed field of preparation induces a narrowed clinical conception of any case. In the questionnaires sent out by the reader, he was obviously unfair. He sought replies only from the teaching hospitals, and those, with one exception, were located in states in which no internship is legally required. The writer also was unfair in comparing the exceptional small hospital that gives a rotational type of service with the eminent teaching hospital that gives an elective service. A better comparison would have been made by considering the many larger and well organized hospitals that have followed the rotational services for years and which have consistently shown no desire to change. The writer also intimates that states which adhere to the rotational type of service ere long would be sure to decline in the efficiency of its practitioners of medicine. The state I have the honor of representing initiated internship as a legal requirement for the fifth year of medicine in 1914. My experience on the board throughout practically all this time has failed to observe any complaint against the rotational service, either from medical faculty or from individual practitioner. Internship aims to make amends for the weakness developed in medical practice when scientific passion swept through our profession some years ago and which shifted toward scientific culture the emphasis formerly placed on the art of medicine. When preceptorships of olden days were eliminated and the prospective physician was shunted from the high school to the college of science and thence into the medical school before he sensed the meaning of the profession, we inevitably acquired in students many professional misfits. Those days are gone, and let them be gone because of other serious weaknesses. However, we need, by the establishment of a proving period before full acceptance to the study of medicine, some such, perhaps, as the probation period now in vogue in schools of nursing, to sensitize the longing neophyte early to the significance of the medical profession. At the end of his medical studies a complete apprenticeship internship in every department of medicine will help to establish more fully the sense of responsibility that is so needful in its practice. By some such procedure we may recapture this vital essence known as the art in medicine and may restore to practice even greater geniuses than the old family doctor.

DR. HAROLD RYPINS, Albany, N. Y.: I would draw your attention to the fallacy of Dr. Metzger's remarks with reference to the training of engineers. Medicine is not engineering. Any analogies as to the proper training of engineers does not carry over into the field of medicine. He speaks about training the honor man of every class of engineers throughout the country, perhaps 1 per cent of the young engineers. If you carry that over into medicine and take the top man, which would be about eighty medical men in the country, it really doesn't make any difference what training you give them, those men will train themselves. What are you going to do about the other 99 per cent? The internship is potentially the most important and, actually, the weakest link in medical education. It is potentially the most important point because it is at that time the young man can really begin to cash in on his four years of rather academic training. It is actually the weakest point because we have relatively, at least, neglected the educational factors of the internship. In the teaching hospitals, by and large, the educational facilities obtained during the internship years are very good. In the average hospital and, certainly, in the smaller hospitals, for the most part, they are very bad. The young man is allowed to take a great deal of responsibility that he isn't trained to take, or else he imitates the bad practice of men who have not had the proper kind of training. It may be that he gets a sense of responsibility and thinks that he can do things but, as a matter of fact, he can either not do them well or not at all. Internship is probably essentially a part of the educational program of the student. If that is true, it should be under the medical schools. The medical schools have the responsibility and the facilities for carrying out the responsibility for training the undergraduate medical students; they are the only people that have it. Sooner or later all the schools will have to take over the responsibility of the fifth year intern

V 11
1938

training and I hope they will not do it in any one set way. I hope some schools will have a rotating service and others will have mixed service, some will have one year services and others will have two year services, but at least it will be on an educational basis, under the auspices of persons who are competent to run an educational program. I do not believe it advisable for the state to take on the guidance of the internship year at all. At present something like 97 per cent of our graduates voluntarily take internships, and I have never found a regulation which affects less than 10 per cent of any of the people affected is a very valuable one. There are certain exceptions. If you do decide that you really must require an internship of every one, it is a serious thing for any state body to set up fixed requirements. Having served as a member of a state body for fifteen years, I want to be recorded as saying that I know of no state educational organization or no state licensing body which has the money or the men or the facilities to speak authoritatively at all about the quality of internships in the hospitals throughout the country. The American Medical Association has five men working on it. They have done as good a job as can be done under the circumstances, but those acquainted with it, including members of the Council, are aware that it is not nearly as good a job as ought to be done. There are many hospitals which are approved which should not be approved. They are constantly being visited and revisited. They should have a larger staff of inspectors to do the job properly. How is any one state board, with perhaps one inspector, going to take on itself the classification of internships throughout the United States? It is a preposterous assumption of power and it is a purely paper matter.

DR. WILLIAM J. PEPPER, Philadelphia: The lack of liberality of the Pennsylvania board is one of my greatest tribulations. Our students want a two year rotating service. I approve of a rotating service two years in length. There are very few of them in the state. Our boys, then, often want to go outside the state; if one says he wants to go to some other hospital outside the state, they say "Well, that is beyond our ken; we are not able to inspect it, and we don't know, if you go there, whether we will examine you." They scare the boy into taking an internship in Pennsylvania and then he has to take a one year rotating service.

DR. E. M. MACEWEN, Iowa City: Coming from a teaching institution, I have some definite notions. I agree with the thesis presented by Dr. Smith that we cannot be limited to the one type, that both types of internship are valuable. I also agree with Dr. Pepper. We are hoping to establish in our institution a two year rotating service. I want to take exception, as Dr. Pepper did, to Pennsylvania. A man who graduated from our institution the second man in a class of ninety-seven, and had a year's rotating internship in one of the leading teaching hospitals in the country, a year's straight internship in our own teaching hospital, then one or two years in a tuberculosis hospital in Connecticut and two years in a tuberculosis hospital in Illinois and is now in a tuberculosis institution in Pennsylvania and cannot get reciprocity because he had only four weeks of obstetrics, because he didn't learn how to run an x-ray machine, and because he can't get a certification showing just how many cases he had through this type of training; yet he is a leading surgeon and is recognized over the country. I agree that we cannot be putting state barriers up.

DR. A. S. BEGG, Boston: I am a dean and while we have to skirmish around and find places for interns, the question about what should be done in the states is beyond my ken. I agree that, if we have a rotating internship, it should probably be of two years' duration. I am also of the opinion that there are many good straight services where a man gets excellent training in services which are not on his list. At the Boston City Hospital, for example, the two year internship in medicine allows the man, by consultation and otherwise, to see a good deal of surgery, a good deal of pediatrics and a good deal of contagious diseases, but yet it is a straight service. It has a lot of things to recommend it. I think the question of settling this matter by the state should be made as easy a modification as possible, because we certainly know there are well trained men from some of these teaching hospitals that ought to be permitted to practice medicine in all the states of the Union.

DR. STANLEY H. OSBORN, Hartford, Conn.: You cannot train a specialist to do general practice work, and you cannot train a general practitioner to do specialty work. What we need is both of these groups. I am strongly in favor of both for the benefit of the people on whom we are practicing.

DR. ROBERT U. PATTTERSON, Oklahoma City: Oklahoma is one of the states mentioned which require an internship before a license to practice is given. In addition, we have in Oklahoma a scarcity of practicing physicians. About 54 per cent of the graduates of the University of Oklahoma, in medicine, return to their own states to practice. That being the case, two years ago we raised the rotation internship from twelve months to twenty-four months. I am in favor of straight internships as well as rotating internships. In Oklahoma we need the rotating internship. Our men are not able to get the training in Oklahoma except in a relatively few hospitals. We advise them to go to teaching hospitals, if it is possible, but of course there are not enough teaching hospitals by any means to meet the demand. If a hospital is approved, we take it as evidence that it has a proper staff, a well organized staff and will take an interest in the interns when they are entrusted to its supervision, and a man who gets an internship, whether it is rotating or straight, in an approved hospital will come out with the information which will make him safe to let loose on society. I am in favor of all kinds of internships, but for Oklahoma I think the men who are going to practice there should have two years, at least, and that is our present position.

DR. WINFORD H. SMITH, Baltimore: My remarks were not solely in favor of the nonrotating type of internship. The whole burden of proof was to get recognition of some other type than the rotating type. I believe these other types are entitled to recognition. Dr. Metzger said I was unfair in comparing the straight internship in the large teaching hospital with the small hospital, as I did. I grant it is unfair, but that is the requirement which is set up in some of the states. For that reason I picked it out, because, I repeat, to me at least it is more or less absurd to compare a rotating internship of one year in a hospital with a daily average of fifty patients with a straight service in a well organized teaching or nonteaching hospital with a sufficient number of beds and sufficient opportunities of an educational character to make that service valuable. My plea is, do not limit your recognition to those who have had only a rotating type of internship. I recognize that there is merit in a rotating internship. I also maintain that there is distinct merit in other types, including the straight internship.

DR. I. D. METZGER, Pittsburgh: Nobody regrets more than I that we are tied down by law to a strict form of rotational type of internship. I wish we were given discretionary powers in many things with respect to the medical act, so that we could do the thing we feel we ought to do. The law was amended two years ago to the effect that, when a person has been out seven or more years, the board may accept an equivalent for internship. We are very glad to accept straight internship when that is the case. I do not, however, state that we ought to have a straight internship and encourage that. I think we still ought to have the rotational type for at least one year, perhaps not so exacting as we require for Pennsylvania.

American Students in Italian Medical Schools

WILLIAM C. MACTAVISH, New York: As the majority of American medical schools require more than the legal minimum requirement of preliminary education, the Italian authorities have agreed to require at least three years of preliminary education for entrance to Italian medical schools. In addition, applicants whose records are otherwise satisfactory are required to demonstrate by examination that they understand the Italian language.

Any American student who desires to apply for admission to an Italian medical school is now referred by the Italian consul in his locality to the Royal Italian Consulate in New York City. He is required to submit a certified copy of his previous academic record. The record is evaluated from the

standpoint of the character of courses completed, general scholastic average, science average and percentile score on the medical aptitude test. The Italian authorities have given friendly cooperation in every way.

The majority of Americans now studying medicine in Italy are matriculated at the University of Bologna. The greatest number were matriculated in 1933-1934 and since then the number has decreased yearly because of the strict control of the commission established at the royal Italian consulate at New York, which has the duty of examining the credentials presented by candidates for admission. Arrangements were made to provide for obligatory posts for internships for American students at the institutes and hospitals, starting with the year 1936-1937, and sixty-five places have been provided.

Foreign Medical Students

DR. C. B. PINKHAM, Sacramento, Calif.: Postbellum problems of growing importance to this congress have challenged the standards of medical education and licensure in this country. During the past few years a rapid change in both medical education and licensure has come about in foreign countries. The seriousness of the situation has caused growing concern as to the future of the heretofore high standards, both ethical and economic, of medical practice in the United States. When it was learned several years ago that a large number of our younger men and women had left the United States, intent on studying medicine in some foreign school, many of the medical examining boards in this country seemed indifferent to the serious problem which would be faced when, as graduates, this group would return to the United States and materially increase the normal influx of foreign medical school graduates intent on qualifying for a license to practice medicine. We comment on the frequency with which graduates of German medical schools file a large document printed in Latin on thin paper and showing (lower margin) what purports to be the seal of the institution. This "seal" is also printed thereon. Such a document purports to be a copy of the applicant's original medical diploma. When questioned, he explains that his original medical diploma is kept in the archives of the university and that a graduate may secure several printed "copies" for use. We ponder as to how many alleged medical school graduates are foisted on the public via a local print shop. During twenty-five years' continuous service as a member and the executive officer of the California Board of Medical Examiners, I have uncovered many fraudulent credentials, including purported medical diplomas.

The majority of the medical examining boards comprising this federation are now thoroughly awakened to the seriousness of the problem presented by both the foreign medical student and the foreign medical school graduate. Many states have refused to license applicants who hold foreign medical credentials. Others, including California, have amended the law governing medical licensure so as to conform with the resolution adopted by the Federation of State Medical Boards at its 1933 session and by the House of Delegates of the American Medical Association at its May 1936 meeting in Kansas City. The problems involved demand that not only medical examining boards but every organization interested in medicine guard against the threatened destruction of the high standards of medical education licensure and practice, which for so many years we have struggled to uphold.

DISCUSSION

DR. WILBURT C. DAVISON, Durham, N. C.: The clinical teaching of an American medical school is far superior to that of practically all the foreign medical schools I have seen, and I have seen most of them. For that reason there is good training there. If the American Medical Association or the Federation of State Medical Boards, and so on, set up rules with regard to excluding certain students we get into diplomatic difficulties, but the individual medical schools can do this; if they decide to admit or not to admit these students into their third or fourth year there will not be many of them admitted, which I think is desirable. In Dr. Pinkham's paper one requirement has been set up; namely, with regard to coming into American hospitals as interns. That I don't think is worth the paper it is written on. There are 6,700 hospitals in this country crying for interns, and they will take almost anything that can walk. I have hundreds of letters on my own desk asking for any kind of intern, it doesn't make any difference whether it is good, bad or indifferent. Mr. MacTavish's figures showed from twenty-one to thirty-seven students a year are going to Italian schools alone. It is really the equivalent of an additional American medical school. Most of those students are city students. Figures show that 80 per cent or more of the city students go back to practice in the city, a field that is overcrowded. In North Carolina there are counties with one physician to 3,500 of population; in South Carolina there is one physician for 4,500 of population. And though the profession is crowded in New York, Chicago and Philadelphia, in the rural districts additional doctors are needed. Why make the present amount of maldistribution worse by increasing the city students, who are largely the ones who go to the Italian schools? An exception should be made for those who are outstanding in their field and have practiced ten years in foreign countries and come over to this country.

DR. JAMES N. BAKER, Montgomery, Ala.: Two underlying causes which have precipitated this problem are (*a*) an ambition on the part of American parents to have their offspring trained somewhere, somehow, for professional careers, and (*b*) the disturbing political unrest throughout Europe, which has been and is now forcing many professionally trained persons to seek greater security elsewhere. Professor MacTavish's paper deals with a culling process applied by one state to a particular group headed for the medical schools of Italy and with 72 per cent of failures, over a five year period, to meet the qualifications considered by him to constitute a fair test. One wonders about the outcome had similar tests been applied to the entire group of 1,648 enrolled in foreign faculties from the United States in 1936-1937. True enough, there has been some decrease; in 1933-1934 there were 1,905, in 1934-1935 there were 1,944 and in 1935-1936 there were 1,637, with 333 completing their courses in this year. California in an effort to comply with a resolution passed by the 1936 House of Delegates of the American Medical Association, has clamped down; no doubt other states, as they encounter present difficulties of evaluating the foreign graduate, will be forced to resort to various devices and to varying degrees of drasticity. Necessarily there will likely follow a conglomerate, incoherent and confusing medley of state regulations bearing on the foreign graduate. Such an unhappy state of affairs already exists regarding medical licensure in general. Might it not be possible at this time and before greater obfuscation arises to attempt to envisage this problem as one national in scope and have the remedy or regulations to be applied broad based on such a concept?

DR. I. D. METZGER, Pittsburgh: There is not a state board in the United States that does not constantly face this proposition. We in Pennsylvania are right near the gateway into which these people come, and it has been necessary from the very beginning to watch carefully the credentials of them all. We don't require that they be licensed, but they must have certification that they may be licensed. Internship should be in America, preferably within one of our own hospitals, in which we can check up on the type of work the candidate is doing. This internship can be granted only after the credentials have been approved by the board, so that the person may eventually be licensed to practice in the state. That is where this weakness comes in the internship business. If the credentials are inadequate, the person may not enter a hospital for internship in Pennsylvania. Examination means written examination and bedside examination or practical examination of each one of these candidates.

DR. J. C. SIMPSON, Montreal: Will the Federation, in considering this matter, please take into consideration the fact of the very close linking of the Canadian schools with those in the United States, taking cognizance of the fact that the same assessing agencies, the same inspection agencies, cover education in the two countries, and perhaps try to differentiate to some degree, at any rate, between the Canadian schools and those in Europe?

V 11
1938

DR. H. M. PLATTER, Columbus, Ohio: In Ohio we have gone as far as we can, without additional legislation, to meet this vexatious problem. Our attorney general tells us that we cannot enact resolutions which are legal and binding beyond the purview of a statute, but we can elaborate on the statute and tell how an individual from a foreign country may meet and submit credentials that are the equivalent of what we demand here.

DR. L. J. KOSMINSKY, Texarkana, Ark.: In Arkansas we have two boards, the regular and the eclectic. I represent the regular. The regular, by resolution, since 1928 has required a man to be a citizen of the United States to take the board examination.

DR. THOMAS J. CROWE, Dallas, Texas: Texas is a border state, and it is easy to cross the Rio Grande River. Sometimes one can wade it in most places. I believe we have enough of certain types of foreign graduates in the United States, and I don't think we should prepare the way for more. Mexico won't allow us in there at all, and I don't see why we should take Mexican graduates

(To be continued)

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

ALABAMA: Montgomery, June 28. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARKANSAS: *Basic Science.* Little Rock, June 4. Sec., Mr. Louis E. Gebauer, 701 Main St., Little Rock. *Medical (Regular).* Little Rock, June 21-22. Sec., State Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Medical (Eclectic).* Little Rock, June 21. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Reciprocity.* San Francisco, May 11, Los Angeles, July 11, San Francisco, Sept. 14, and Los Angeles, Nov. 16. *Written examinations.* San Francisco, June 27-30, Los Angeles, July 11-14, and Sacramento, Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

CONNECTICUT: *Basic Science.* New Haven, June 11. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven.

DELAWARE: Dover, July 12-14. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

DISTRICT OF COLUMBIA: *Basic Science.* Washington, June 27-28. *Medical.* Washington, July 11-12. Asst. Sec., Commission on Licensure, Mr. Paul Foley, 203 District Bldg., Washington.

FLORIDA: Jacksonville, June 13-14. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Joint Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

ILLINOIS: Chicago, June 28-July 1, and Oct. 18-20. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

INDIANA: Indianapolis, June 21-23. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, 301 State House, Indianapolis.

KANSAS: Kansas City, June 7-8. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 903 N. 7th St., Kansas City.

KENTUCKY: Louisville, June 8-10. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. 3rd St., Louisville.

MARYLAND: *Medical (Regular).* Baltimore, June 21-24. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Medical (Homeopathic).* Baltimore, June 21-22. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MICHIGAN: Ann Arbor and Detroit, June 13-15. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-3-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, April 19-21. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

NEBRASKA: *Basic Science.* Omaha, May 3-4. *Medical.* Omaha, June 8-9. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, May 2. Sec., Dr. John E. Worden, Capitol Bldg., Carson City.

NEW JERSEY: Trenton, June 21-22. Sec., Dr. James J. McGuire, 28 W. State St., Trenton.

NEW YORK: Albany, Buffalo, New York, and Syracuse, June 27-30 and Sept. 19-22. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 13. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, July 5-8. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OKLAHOMA: *Basic Science.* Oklahoma City, May 4. Sec. of State, Hon. Frank C. Carter, State Capitol Bldg., Oklahoma City. *Medical.* Oklahoma City, June 8-9. Sec., Dr. James D. Osborn, Jr., Frederick.

OREGON: *Basic Science:* Corvallis, July 16, and Portland, Nov. 19. Sec., State Board of Higher Education, Mr. Charles D. Bryne, University of Oregon, Eugene.

PENNSYLVANIA: Philadelphia and Pittsburgh, July. Sec., Board of Medical Education and Licensure, Dr. James A. Newpher, 400 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, June 28. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: July 19-20. Director of Medical Licensure, Dr. B. A. Dyar, State Board of Health, Pierre.

TEXAS: San Antonio, June 20-22. Sec., Dr. T. J. Crowe, 918 Mercantile Bldg., Dallas.

VERMONT: Burlington, June 15-17. Sec., Board of Medical Registration, Dr. W. Scott Nay, Underhill.

VIRGINIA: Richmond, June 22-24. Sec., Dr. J. W. Preston, 30½ Franklin Road, Roanoke.

WISCONSIN: Milwaukee, June 28-July 1. Sec., Dr. Henry J. Gramling, 2203 S. Layton Blvd., Milwaukee.

WYOMING: Cheyenne, June. Sec., Dr. G. M. Anderson, Capitol Bldg., Cheyenne.

NATIONAL BOARD OF MEDICAL EXAMINERS SPECIAL BOARDS

Examinations of the *National Board of Medical Examiners* and *Special Boards* were published in THE JOURNAL, April 9, page 1218.

Texas November Examination

Dr. T. J. Crowe, secretary, Texas State Board of Medical Examiners, reports the written and practical examination held at Wichita Falls, Nov. 8-10, 1937. The examination covered 12 subjects. An average of 75 per cent was required to pass. Sixteen candidates were examined, 10 of whom passed and six failed. The following schools were represented:

School	PASSED Year Grad.	Per Cent
Georgetown University School of Medicine	(1936)	76.3
University of Minnesota Medical School	(1936)	77.2
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1921)	88.4*
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1930) 86.2,* (1936)	78.6*
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1932)	84.4*
Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest	(1922)	78.2*
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	(1937)	75
Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow	(1936)	78.1*
Osteopath†		79.3

School	FAILED Year Grad.	Per Cent
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1913)	71*
Escuela Medico Militar, México, D. F.	(1928)	64*
Universidad Nacional Facultad de Medicina, México, D. F.	(1928) (1936) 70.1,* (1937) 62.6*	61.8,*
Osteopath†		68.3

Eighty-nine applicants were licensed by reciprocity on November 10 and December 10. The following schools were represented:

School	LICENSED BY RECIPROCITY Year Grad.	Reciprocity with
University of Arkansas School of Medicine	(1932, 2), (1933), (1934), (1936, 2), (1937, 2)	Arkansas
Chicago Medical School	(1935), (1937, 2)	Illinois
Northwestern University Medical School	(1929) (1935), (1936)	Michigan, Illinois
Rush Medical College	(1934)	New York
University of Illinois College of Medicine	(1937)	Illinois
Indiana University School of Medicine	(1934)	Indiana
State University of Iowa College of Medicine	(1933)	Iowa
University of Kansas School of Medicine	(1931)	Kansas
University of Louisville Medical Department	(1909)	Illinois
Louisiana State University Medical Center	(1936), (1937)	Louisiana,
Tulane University of Louisiana School of Medicine	(1929), (1934, 2), (1936, 2), (1937, 3)	North Carolina Louisiana
College of Physicians and Surgeons of Baltimore	(1915)	Maryland
University of Maryland School of Medicine	(1908)	N. Carolina
University of Maryland School of Medicine and College of Physicians and Surgeons	(1934)	Maryland
University of Minnesota Medical School	(1936), (1937)	Minnesota
Washington Univ. School of Medicine	(1933), (1934), (1935)	Missouri
Creighton University School of Medicine	(1925) (1932)	Nebraska, New Jersey, (1935) California
University of Nebraska College of Medicine	(1927), (1932) (1933)	Nebraska, Iowa, (1936) Maryland
Albany Medical College	(1898)	New York
Long Island College Hospital	(1906)	New Jersey
Univ. of Buffalo School of Medicine	(1918), (1927), (1932)	New York
University of Rochester School of Medicine	(1933)	Maryland
University of Cincinnati College of Medicine	(1934, 2)	Ohio
University of Oklahoma School of Medicine	(1935, 2), (1936)	Oklahoma
University of Oregon Medical School	(1927)	Oregon
University of Tennessee College of Medicine	(1934), (1935)	Tennessee
Vanderbilt University School of Medicine	(1923) (1933)	Tennessee, Mississippi
University of Virginia Department of Medicine	(1933)	Virginia
Univ. of Toronto Faculty of Med.	(1923)	Minnesota, (1928) Oregon
Osteopaths‡	Iowa, 6, Kansas, Michigan, 2, Missouri, 8, New Oklahoma, 3, Pennsylvania, South Dakota, 2	Mexico,

* Verification of graduation in process.
† Examined in medicine and surgery.
‡ Licensed to practice medicine and surgery.

Book Notices

The Rehabilitation of Speech: A Textbook of Diagnostic and Corrective Procedures. By Robert West, Ph.D., Professor of Speech Pathology, University of Wisconsin, Lou Kennedy, Ph.D., Associate Professor of Speech, Brooklyn College, New York, and Anna Carr, M.A., Clinical Adviser in Speech, State Teachers College, Milwaukee, Wisconsin. Cloth. Price, $4. Pp. 475, with 28 illustrations. New York & London: Harper & Brothers, 1937.

The repetitional features of most books on the subject of speech disorders causes them to be placed in the category of academic interest for only a brief time. This book is different, because the arrangement of material is original and tends to meet in a practical way the specific needs of an ever widening specialty. It covers the field of speech disorders in a comprehensive manner. The material is divided into five main parts. Part one is a creditable effort. Under the general heading of diagnostic procedures, the neurophysiologic mechanism for speech is briefly covered so that the reader is technically prepared for both normal and abnormal speech development. Then follow those speech disorders which fall into the category of abnormal psychology, psychopathology or psychiatry; that is, those which have no organic or structural basis. Although the authors consider stuttering a psychogenic disorder, they also state that, "while psychogenic disorders are undoubtedly functional in nature, they are nevertheless more prevalent among children showing poor physiological and neurological stability." They point out the fact, under hereditary background, that "the condition underlying the stuttering is transmitted from parent to offspring by biological heredity." They further point out that the stutterer has a special makeup, "a type of constitution that, though rugged, is not suited to the exigencies of social life," and that a secondary phase of stuttering is the reaction of the patient toward his stuttering speech, which ultimately warps his whole personality and leads to the development of a definite neurosis—an anxiety neurosis. The chapters which follow deal with dyslalias caused by mouth deformities such as cleft lip, cleft palate and dental anomalies. Under "Rhinolalia Caused by Nasal Obstruction" the authors advocate the use of Dr. Russell's term, "cul-de-sac resonance." Since the quality of tone known as nasality is the result of resonance in a cul-de-sac resonator, it would be better to refer to this quality as "cul-de-sac resonance" than as "nasal resonance." This is a practical suggestion which should be appreciated by vocal and speech teachers. Another chapter deals with vocal defects caused by pharyngeal and laryngeal deformities. It tells briefly, both etiologically and therapeutically, about many dysphonias of importance to the speech pathologist. There is a clear and informative chapter on neuropathologies of speech spastics, and the speech involvement of the feebleminded is also briefly touched on. Dyslalias caused by deficiencies of hearing are extensively treated so that the student gets a concise working knowledge of the entire field of hearing defects; and the authors conclude part one with a chapter on case study and diagnosis, which should prove of practical value to speech practitioners.

Part two is given over to remedial procedures for older children and adults. The authors outline types of speech clinics and the characteristics which the clinician should possess. There are the usual general exercises for the tongue, lips and velum, and several chapters describing the articulatory adjustments for special articulatory defects. There is also a discussion on the therapy of the stutterer. Various phases of remedial procedures are given, but as in most cases—since the subject is of such an intangible and personal nature—they still leave much to be desired. The remainder is devoted to therapy for cleft palate speech, rhinolalia, vocal disturbances, spastic speech, and speech defects of the feebleminded. Part three gives remedial procedures in the form of exercises and drills for cases of omissions and substitutions of sound units in the speech of children. Part four is a treatise on foreign language influence. The factors in the retention of a foreign accent are pointed out, and the usual measures are outlined to counteract the various oral inaccuracies. Part five deals with speech reading; that is, the teaching of oral speech to the deaf. The few exercises for lip reading are given in phonetic transcriptions to secure accurate symbolization of sounds.

Following these five major parts, the book has an appendix containing a number of practical features which should prove of value to the teacher and student of speech. There are, in addition, clear and instructive illustrations throughout the book. The twelve plates showing the position of the articulators, however, would perhaps be of more interest to the reader if they were in color. In black and white they are drab and detract from the appearance of the book. The authors deserve special commendation for excluding controversial matters. By so doing, the distractive controversy which has long centered around handedness in connection with stuttering is eliminated. Therapeutic measures, however, should have had more elaboration, and issue should be taken with the statement made on page 64 that "the adult stutterer who has developed the psychoneurotic aspect of dysphemia is likely to continue to stutter the rest of his life." This does not coincide with the experience of others in this special field. Here and there a little more detail in less technical terminology would have proved more helpful to the student who has not received special speech training. Also fewer phonetic symbols should have been employed. While phonetic symbols have their place in a book such as this, readers unfamiliar with them will find their excessive use confusing rather than clarifying. Naturally, any work of this type is rather heavy, but this book seems unnecessarily so, as though in their desire to be technical and scientific the authors overcompensated. This, however, does not alter the fact that as a textbook of diagnosis and corrective procedures "The Rehabilitation of Speech" will undoubtedly fill a long-felt need.

Diseases of the Skin: A Manual for Students and Practitioners. By the late Robert W. MacKenna, M.A., M.D., Ch.B. Fourth edition revised and enlarged by Robert M. B. MacKenna, M.A., M.D., M.R.C.P., Honorary Dermatologist, Royal Southern Hospital, Liverpool. Cloth. Price, $7. Pp. 557, with 234 illustrations. Baltimore: William Wood & Company, 1937.

The arrangement of the material is in twenty-six chapters, the scheme in the main etiologic, beginning with anatomy, physiology, examination and treatment, followed by descriptions of coccic, tuberculous, protozoal, fungous, parasitic and virus diseases of the skin, and terminating with discussions of diseases especially affecting the hair, fat glands and sweat glands, pigmentary anomalies, "tumours," and finally diseases of the nails. The type is large and easy to read. It is written for the medical student and general practitioner; its four paragraphs, less than one page, on pathology will not help a candidate for the American specialty examinations. All common dermatoses are described satisfactorily and in a practical manner. Sabouraud is followed in the consideration of streptococcic dermatoses, under the title of "Subacute and Chronic Forms of Impetigo," as has recently been stressed by James H. Mitchell in this country. Tuberculosis is well presented, in part, of course, because it is common in Great Britain. Schaumann's disease, the primary skin complex, the usually negative tuberculin reaction in sarcoid, the salt-free diet and treatment by physicotherapeutic agents are all appropriately discussed. The photographs are good but not excellent—the author would learn from George Miller MacKee and Howard Fox—but the colored plates should be the frank envy of American writers, who cannot get publishers to pay for them. Neither Sutton's nor Ormsby's textbook is comparably embellished. The style of positive statement, direct and brief, is an advantage to the beginner. Some sentences are intentionally bald and so stick in the memory: concerning the Wassermann test, "The reaction is not a specific test for syphilis," a fact profitably retained. As J. Gardner Hopkins recently said, nobody knows what the Wassermann reaction is or what causes it. Treatment of syphilis by courses with rest periods, characteristically not American, will antagonize any one familiar with the conclusions of the Cooperative Clinical Group. References to recent journal articles are few but selected. They are almost all in English, and the majority are British. Altogether, the book is a sound compilation of basic dermatology, well written, well illustrated, no more debatable as to its content than other works analogously representative of a particular school of thought. Next to Macleod's more pretentious work, it is the best of the British textbooks.

V 11
1938

The Microtomist's Vade-Mecum (Bolles Lee): A Handbook of the Methods of Animal and Plant Microscopic Anatomy. Edited by J. Brontë Gatenby, M.A., Ph.D., B.A., Professor of Zoology and Comparative Anatomy, Trinity College, Dublin, and Theophilus S. Painter, A.B., A.M., Ph.D., Professor of Zoology, Texas University, Austin, Texas, and others. Tenth edition. Cloth. Price, $9. Pp. 784, with 11 illustrations. Philadelphia: P. Blakiston's Son & Co., Inc., 1937.

For fifty years Bolles Lee's book has been widely used in histologic and embryologic laboratories. It continues to be a standard and convenient reference work for the research laboratory. The present editors have tried to widen its scope by adding a brief outline of technical procedures, but the encyclopedic character of the work makes it unsuitable for beginners especially as there are several good elementary manuals available. Bolles Lee personally tested every method he thought worth including in his book. Dr. Gatenby finds this impracticable at the present time, so many new methods have been accepted on the authority of those who have described them. On the other hand he has added critical discussions of certain cytologic problems in fixation and staining which should clarify the situation. There are still many biologists who believe that staining methods have the specificity of qualitative chemical tests. A careful reading of these discussions should make obvious the inadequacy of the technical procedures such misguided workers have used. The size of the book was rigidly kept down in the first seven editions of Lee. In this edition the book is 50 per cent larger than in the seventh. Ninety-eight pages on botanic methods (by D. G. Gatcheside) have been added, as well as sixteen pages on vital staining (R. J. Ludford). A new chapter on chromosome methods has been written (T. S. Painter). The sections on general and special technics have been amplified in many ways. The new treatment of fatty substances (by W. W. Kay and R. Whitehead) is especially commendable. Naturally there are regrettable omissions. There is no mention of the newer silver-on-the-slide methods which have made it possible to obtain impregnations in well fixed material free from the numerous artefacts of the silver-in-the block procedures. The work continues to be well edited and printed; now it has a water and vermin proof binding to boot.

110
938

Handbuch der Artefakte. Morphologische und funktionelle Simulationen und Dissimulationen. Herausgegeben von Dr. med. Julius Mayr, o. Universitätsprofessor und Direktor der Dermatologischen Klinik und Poliklinik der Universität Münster (Westf.), et al. Paper. Price, 22 marks. Pp. 470, with 135 illustrations. Jena: Gustav Fischer, 1937.

The authors present a thorough analysis of the various types of malingering (simulation and dissimulation) so often resorted to for purposes of gain by individuals of normal psychic make-up and by patients of psychopathic constitution. The work is divided into eleven sections, with a number of subheadings. Hermann Stefan discusses simulation and dissimulation in psychiatry and neurology. A general discussion of this subject matter is presented and is followed by the description of the psychologic and psychopathic substrata for self-inflicted wounds and self mutilation. Case histories of individuals of sound mind, of congenital inferiority and of patients suffering from the symptom complex of epilepsy, schizophrenia and hysterical habitus augment the text. A thorough index and a summary of the material presented concludes the chapter. The second division of the work is contributed by Julius Mayr. Forty-one well executed photographic illustrations embellish the text. It deals particularly with skin lesions produced by malingerers. Illuminating case histories are recorded. The methods resorted to by patients to produce various pathologic states, their morphology, the differential diagnosis and the treatment are described. The author calls particular attention to simulations resorted to by those in military service. Venereal disease artificially produced is described. A thorough bibliography is appended. The other divisions of the work describing simulations of diseases in the region of the neck, nose and throat (Wilhelm Berger), simulation of diseases and functional aberrations of the eye (Oswald Marchesani) and those of internal diseases (E. W. Baader) are written in the same engaging manner as the preceding chapters. Simulation of drunkenness, lead poisoning, silicosis, diabetes, disease of the gastro-intestinal tract and respiratory diseases are discussed. Chapter 6 (Carl Ludwig Gross) is of particular interest to the surgeon. Here are described methods used by malingerers to produce a large variety of conditions, including artificial inguinal hernia, prolapse of the rectum, rectal fistula, injuries to the sex organs, diseases of the genito-urinary apparatus, artificial tumors, artificially produced subcutaneous emphysema, diseases of the joints, mutilation and injuries of portions of the extremities, artificially produced inflammations and phlegmons, introduction of foreign bodies into the gastro-intestinal tract and other portions of the body, production of ulceration, gunshot wounds, artificial swellings and simulation of diseases of the stomach and lungs. All these make interesting and informative reading. F. Siegert contributes an excellent chapter on simulations and dissimulations in gynecology. Otto Ullrich is the author of artificial clinical manifestations in childhood (chapter 8). The work concludes with the medicolegal aspects of the questions discussed, supplemented by an author's index and a good general index. The work can be highly recommended to the general practitioner, specialist and surgeon and particularly to those who are engaged in work which may require the rendering of opinions before industrial boards, insurance companies and in courts of justice, besides being informative from the general educational point of view and affording food for reflection on the ingenuity of the human mind to gain an end.

Lipogenesis in the Animal Body, with Special Reference to the Physiology of the Goose. By Francis G. Benedict, Director, Nutrition Laboratory, Carnegie Institution of Washington, and Robert C. Lee, Carnegie Institution of Washington Publication No. 489. Paper. Pp. 232, with 30 illustrations. Washington, D. C.: Carnegie Institution of Washington, 1937.

This monograph presents the gathered ends of twenty-three years of sporadic investigation at the Carnegie Nutrition Laboratory on the metabolism of the goose, particularly with reference to the problem of fat formation. The collected work represents a mountain of labor and investment and the outcome appears to be a not very large body of new fact. The only new conclusion of fundamental significance, which is unfortunately supported by relatively meager data, seems to be that, contrary to expectation, one finds no difference in the calorific equivalent of oxygen by comparison of direct and indirect calorimetry, regardless of whether carbohydrate is being burned or being laid down as fat. This statement is in reality a denial of the laws of thermodynamics and is inherently improbable. It is supported by a scanty five observations which vary by 5 per cent among themselves, whereas the expected difference in the particular experiments is just about this amount. No statistical treatment is given but a rough statistical calculation shows that the authors are absolutely unjustified in their deduction. The final conclusion of the authors of the monograph may be quoted in their own surprising words: "As a result of our experience with direct calorimetric measurements on geese during surfeit feeding of carbohydrate, which showed essentially negative results so far as the presence of exothermic heat is concerned, we believe that any further direct calorimetric observations on animals would be unprofitable," and their final sentence, "As a result of our experience with geese, we would not recommend any further direct calorimetric measurements." As a private recommendation to the regulating body of the Carnegie Institution with regard to the program of the Nutrition Laboratory this may be a valid suggestion, but as a dictum for other investigators it is absurd. The deductions from the experiments presented in the monograph in reality throw out a sharp challenge to a new generation of biophysicists to improve existing technics so that the applicability of the laws of thermochemistry to biologic systems carrying on such processes as fat synthesis can be adequately tested in more than five experiments and with a random error of less than the order of magnitude of the differences expected.

One suspects that the laws of thermodynamics cannot be dismissed as summarily as Benedict and Lee have dismissed them. It might be inferred by the reader that Benedict and Lee labored under the delusion that what was impossible with their skill and with the resources of the Carnegie Institution simply could not be done. One recalls the classic prediction of Müller that the velocity of the nerve impulse could never be measured, ten years before Helmholtz performed the feat. Benedict and Lee have not said that the laws of thermodynamics will never be shown to apply fully in the living organism

but they have advised against trying to establish such applicability. Especially since they have said in essence (p. 231) that in practice one should deny the applicability of thermodynamics to lipogenesis, these authors are open to strong censure for their uncritical attitude as regards their own experiments and reasoning.

After urging that all direct calorimetry on animals be abandoned, the authors grudgingly admit that such work on pathologic human beings might still be useful. How the latter can be worth while when the former is not is difficult to comprehend. The remark might be interpreted as a means of escape from criticizing the Russell Sage calorimeter work while insisting that all the animal work that could profitably be done is now complete. In certain other respects the book is worth while. The analysis of the effects of feeding and the influence of obesity on the total metabolism are valuable. The added proof that stored fat is not without effect in raising the total energy expenditure of the organism is important to medicine. The studies of heart rate and other general physiologic phenomena are contributions to comparative physiology.

Statistical Methods Applied to Experiments in Agriculture and Biology. By George W. Snedecor, Director of the Statistical Laboratory of Iowa State College, Ames, Iowa. Cloth. Price, $3.75. Pp. 341, with illustrations. Ames, Iowa: Collegiate Press, Inc., 1937.

The proper understanding of statistical methods in biology and medicine appears extraordinarily difficult to most physicians. Hence investigations requiring a statistical presentation are often unsatisfactorily prepared, the problem is dodged, or the figures are merely supplied to a "statistical expert." The author of this volume believes that an advanced mathematical training for the use of the statistical method is not necessary. This book is therefore designed for an individual to study by himself. The material is divided into chapters on the various elements of the statistical method; namely, attributes, individual comparison, group comparison, short cuts, regression, correlation and analysis of variants. Each point is illustrated by examples of graduated difficulty. Although the material constitutes difficult reading for most physicians, the book has something definite to offer to those who have the time and interest to devote to unaccustomed studies.

Die Lungenerkrankung der Paprikaspalter. Von Dr. Franz v. Kováts, a. o. Professor. Vorstand der städt. Lungenfürsorgestelle in Szeged (Ungarn). Tom. VIII, Fasc. 1, Acta litterarum ac scientiarum reg. Universitatis Hung. Francisco-Josephinae. Sectio Medicorum. Boards. Price, 4 marks. Pp. 92, with 35 illustrations. Budapest: Eggenbergersche Buchhandlung, Karl Rényi; Leipzig: Johann Ambrosius Barth, 1937.

The pulmonary diseases of paprika cutters exhibit a peculiar form previously unknown pathologically. The first case of a paprika cutter having a lung disease was observed for a period of six years without information being obtained that would lead to the discovery of the real cause or causes of the phenomena. The need for a comprehensive study led the author to a thorough investigation of the various factors involved in the disease. He has collected all available information on the known cases and investigated the accompanying circumstances. The relationship is shown among the various pathologic conditions. The dissertation starts with a discussion of the varieties of mold growing in paprika and the causes of illness of paprika cutters. The author believes that the disease is due to the development of a mold fungus accompanied by numerous spores. This is based on the finding of fungous infection in the lung. These spores cause catarrh of the air passages, which in turn leads to acute forms such as bronchitis and exudative bronchialveolitis. In a short time a subacute condition appears, characterized by a treelike formation and changes of the costal pleura. It is stated that the chronic disease appears after about ten days. The end results consist in a spreading fibrosis and bronchiectasis. Symptomatology and diagnosis, illustrated by roentgenograms, are followed by a discussion of the pathologic conditions for about 200 individual cases. The various forms of the illness are described under the headings (1) acute, (2) subacute and (3) chronic. Acute conditions include bronchitis and peribronchitis, which cannot be differentiated by x-ray plates. Congestion of a catarrhal type and exhaustive bronchialveolitis are considered next. Numerous plates illustrate the various forms. It is stated as a general theory that the numerous manifestations of the chronic form can be seen only after an exposure of approximately ten years. The separate chapters that follow are on complications, differential diagnosis and prognosis. The book closes with two pages devoted to prophylaxis and therapy.

The Surgery of the Sympathetic Nervous System. By George E. Gask, C.M.G., D.S.O., F.R.C.S., Consulting Surgeon, St. Bartholomew's Hospital, London, and J. Paterson Ross, M.S., F.R.C.S., Professor of Surgery, University of London. Second edition. Cloth. Price, $4.50. Pp. 191, with 50 illustrations. Baltimore: William Wood & Company, 1937.

That this little monograph on so specialized a subject should have met with a demand for a second edition within less than three and one-half years is ample evidence of its value to the medical profession. So enthusiastic a reception for a work of this type is surprising. The authors have adhered closely to their title. The clinical history of the diseases with which they deal finds little place here. The book presupposes a thorough knowledge of the conditions under discussion. The uninformed will find little to aid them in diagnosing their cases. Differential diagnosis is not considered. The authors' sole concern in this direction is with selection of cases for operation from among those already recognized and classified. The discussion of the anatomy and physiology of the sympathetic nervous system is minimal, being restricted to that absolutely demanded by their discussion of surgical procedures. The discussion of the surgery of the sympathetic nervous system is sound and conservative with the possible exception of three minor sections dealing with the relief of dysmenorrhea and of vesical and renal pain, with which the authors seem to have had little or no experience. At least they cite none of their own experiences and uncritically accept a number of unduly enthusiastic reports from the literature. In this connection it is to be noted that the authors recommended that only cases of dysmenorrhea "of the spasmodic type" be submitted to sympathectomy and that "the operation should never be performed for the congestive type" without any indication as to how this differentiation is to be made. It is of interest that the authors have accepted completely Lewis's views as to the pathophysiology of Raynaud's disease. But in so doing they have ignored all evidence antagonistic to this view, even that present in their own observations reported in these pages. It is also noteworthy in connection with this uncritical attitude that their statement on page 113 relative to Raynaud's disease, that although sympathectomy does not result in a vasodilatation comparable to the normal state "the sympathectomy enables the vessel lumen to remain open when exposed to a degree of cold which was previously sufficient to close it," their own observations presented in figure 39, page 111, are to the effect that the degree of vasoconstriction, as indicated by surface temperature, was greater (not less) under identical conditions following the sympathectomy than it was before. The authors' attitude in general toward ganglionectomy in the treatment of Raynaud's disease of the upper extremities is favorable to a degree not compatible with the experience of other surgeons. In the main the book is sound. It is clearly and concisely written, the typography is excellent and the illustrations are good. There is a satisfactory index.

Verzögerte Knochenbruchheilung und Pseudarthrosenbildung: Ihre Ursachen und Behandlung. Von Prof. Dr. Georg Brandt, Vorstand der chirurgischen Klinik des städtischen Krankenhauses Mainz. Paper. Price, 13.50 marks. Pp. 175, with 223 illustrations. Leipzig: Georg Thieme, 1937.

The author offers a concise but exhaustive presentation of the subject. The first chapter is devoted to the histologic course of normal bone healing and such variations of it as lead to the development of aberrations and deficiencies, the observations being based largely on Lexer's views on pseudarthrosis. The next chapter is devoted to the pathologic description. The author discusses the causes of nonunion from the constitutional and nutritional, from the general as well as from the local, point of view. There is nothing new offered in the chapters on the general causes. From the local point of view, some interesting features are discussed; important mechanical-dynamic factors, particularly disturbance and imbalance of stresses, are cited as predisposing factors or as causative agencies. Here an interesting feature is the discussion of the mutual influence

V 11
1938

of the parallel forearm bones on the formation of transformation zones and pseudarthroses, the influence of the fibula on pseudarthrosis formation, and healing of the tibia. The chapter on treatment reviews the usual osteoplastic methods and adds a few less well known items. Of interest is the application of osteotomy on the neighbor bone in the treatment of pseudarthrosis of the forearm, the block action of the fibula, and the effect of the osteotomy of it on healing of the pseudarthrotic tibia. The last chapter is devoted to the description of casts and braces and supportive apparatus. The volume does not contain a great deal of new facts but is well written and concise. It should be of particular value to the general surgeon who is interested in reconstructive work on the bones.

The Practitioners Library of Medicine and Surgery. Volume XII: Preventive Medicine and Hygiene. Supervising Editor: George Ethmer, M.A., M.D., David P. Smith Clinical Professor of Medicine, Yale University School of Medicine. Associate Editor: Ira V. Hiscock, M.A., C.P.H., Professor of Public Health, Yale University School of Medicine. Cloth. Price, $10. Pp. 993, with 45 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1937.

The twelfth volume of the Practitioners Library of Medicine and Surgery is a sound, composite textbook on preventive medicine and hygiene. Such a book is of the greatest importance in rural medical practice. After a discussion of periodic physical examination there are special chapters dealing with water, clothing, exercise and rest, excretions, sunshine, cleanliness and personal mental hygiene. The second portion of the book concerns preventive medicine as it applies to groups of human beings; the third section deals with community health; the fourth section covers the prevention of infectious diseases, as well as the diseases of the various systems of the human body. All the men selected to prepare various portions of this book are writers who have had special training and interest in the topics they discuss. The book is practical, authoritative and obviously a fundamental addition to this system of medicine and surgery.

110
938

Short Years: The Life and Letters of John Bruce MacCallum, M.D., 1876-1906. By Archibald Malloch. Cloth. Price, $3.50. Pp. 343, with 15 illustrations. Chicago: Normandie House, 1938.

John Bruce MacCallum, brother of Dr. W. G. MacCallum, was born June 8, 1876, and died in 1906—just 30 years of age. After studying at the University of Toronto and Johns Hopkins, he traveled to Germany for postgraduate study. He returned broken in health and much of the rest of his brief career was spent in search of recovery. He was in Denver as a teacher of anatomy and at the University of California, where he worked with Jacques Loeb. In 1905 he acquired a severe albuminuria which, associated with extensive chronic tuberculosis, resulted in his death. Dr. Archibald Malloch has written the biography of the man largely by the use of his letters and poems. For those who knew him and who knew the families of Osler, Malloch and MacCallum, this book will constitute a beautiful as well as a most interesting volume of memory and reminiscences.

Über sogenannte "kosmische" Rhythmen beim Menschen. Von Professor Dr. B. de Rudder, Direktor der Universitäts-Kinderklink, Frankfurt a. M. Paper. Price, 1.80 marks. Pp. 46, with 2 illustrations. Leipzig: Georg Thieme, 1937.

The author expounds the possible effect of cosmic influences on man. He does not mean occult phenomena but geophysical effects and considers this new field of study bioclimatic or meteorobiologic. Many influences of an extraterrestrial nature are mentioned as theoretical possibilities, but no actual correlations are given between them and variations in man. His proposed field is one in which Peterson has long worked (The Patient and the Weather) but the author is unacquainted with this work.

Poisoning the Public: Daily Contacts with Toxic Materials as Civilization Marches on. By Russell C. Erb. Cloth. Price, $2. Pp. 219. Philadelphia: Dorrance & Company, 1937.

The author of this book has tried to survey the field of toxicology as it relates to contact with poisonous substances in water, food and atmosphere, in flora and fauna, in the household, in industry and even in war; all this in a small volume intended for the public. Unfortunately the work is poorly organized and clumsily written. It contains many errors of fact, judgment and interpretation too numerous for specific citation. It is likely chiefly to frighten the "daylights" out of the average layman, without giving him a sufficient background of accurate information. The layman should know the potential sources of intoxication and how to avoid them; he should be able intelligently to support legislation designed to remove many of the current menaces to health. But it will require a more adequate study than this to give him a reasonable understanding of this important subject.

A Meandering Hoosier. By Hugh A. Cowing, M.D. Cloth. Price, $2.15. Pp. 257, with 61 illustrations. Muncie, Indiana: Scott Printing Company, 1937.

In this book Dr. Hugh A. Cowing has assembled his personal impressions of many interesting places which he has visited, some marvelous reproductions of photographs, and some miscellaneous poems developed in connection with his travels. Other physicians who have traveled the path that he has followed and who are interested in medical belles lettres will find the book interesting and entertaining.

Tenth Annual Report of the Missouri Workmen's Compensation Commission. The Statistical Year of 1936 and Operating Year of 1937. Paper. Pp. 20. Jefferson City, Missouri, [n. d.].

The number of accidents in 1937 was 73,741, compared with 70,243 in 1936. The Missouri workmen's compensation law has been in operation since January 1927, and during the period from January 1927 to January 1937 "729,209 cases were reported to the Commission on which $24,710,961.99 was authorized in compensation and $11,269,835.62 in medical aid—a total of $35,980,797.61."

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Accidental Injury Defined.—As the workman, in the course of his employment, was loading cartons of bread weighing from 35 to 40 pounds each, he turned suddenly to get a better hold on one carton and felt a sharp pain in his left side. It gave him a sickening feeling all over, especially in the stomach, and he was compelled to sit down for twenty or thirty minutes until the nausea passed away. He had bearing down pains thereafter and that night he discovered a hernia on the left side. In resisting his claim for compensation before the industrial commission of Utah, his employer's insurance carrier contended that, although the injury in question occurred suddenly, undesignedly and unexpectedly at a definite time and place, yet it could not be termed an accidental injury within the meaning of the workmen's compensation act unless there was present evidence of strain or overexertion, in the absence of some unforeseen or unusual happening, and that there was no evidence in the present case of strain or overexertion. The industrial commission, however, awarded compensation to the workman and an appeal was taken to the Supreme Court of Utah.

The word "accident" as used in the workman's compensation act, said the court, is not limited to any arbitrary, legal, technical or contractual meaning, nor to things external to the person injured, as falling bodies, explosions, or breaking of equipment which in turn injures the workman. It includes also the injury to the workman himself. The injury is an "accident" when it results, not from the wear and tear on the body of the workman, incident to long, continued effort but when it occurs unexpectedly as a result of the work being done. There was evidence in this case, the court continued, that the employee sustained a hernia on the day in question, that the injury occurred suddenly and at a definite time and place, that it was an unusual result of the work being done and that it did not result from a preexisting condition. To render an injury accidental within the workmen's compensation act does not require that the strain be such that other

men would not attempt it or would anticipate probable injury therefrom. It simply means that the effort exerted, considering the position in which the workman was put by the work being done at the instant of the injury, was such that an injury, unanticipated and unforeseen, resulted to the workman. The Supreme Court accordingly believed that the industrial commission was justified in its award of compensation and affirmed that award.—*Continental Baking Co. v. Industrial Commission (Utah), 69 P. (2d) 268.*

Malpractice: Fecal Fistula Following Operation for Intestinal Obstruction.—Gross suffered severe abdominal pains and the defendant, assisted by two other physicians, performed an exploratory operation to ascertain the cause of the pains. Adhesions of the bowel were discovered which had caused an obstruction. The obstruction was removed and the wound was closed. Several days after the operation the patient began to vomit fecal matter. This condition continued for seventeen or eighteen days, "when one of the intestines ruptured and through this rupture the contents of the bowels and stomach forced their way through the incision, and, in the region of the navel, which was at the upper end of the incision, there was created an opening which is termed a 'fistula.' Thereafter the contents of the bowels discharged through this fistula." The defendant attended the patient at the hospital for about a month and thereafter called at his home on several occasions over a period of about three weeks. He then seems to have discontinued his connection with the case. Thereafter for about two years the fistula continued and the plaintiff had no normal bowel movements. Subsequently another physician operated, found an obstruction in the bowel where the previous operation had been performed, and eventually the patient was restored to a normal condition. The patient then brought suit for malpractice against the defendant. The jury rendered a verdict for the plaintiff but the trial court entered a judgment in favor of the defendant notwithstanding the verdict. The plaintiff appealed to the Supreme Court of Washington.

The principal question before the Supreme Court was whether or not the evidence was sufficient to take the question of the defendant's negligence to the jury. From the evidence, the court concluded that the jury had a right to find that at the time of the operation there was no infection; that some days after the operation there was an obstruction of the bowel; and that the patient was discharged from the hospital at a time when he needed further medical attention. In addition to this, the fact that a subsequent operation was necessary, while not sufficient in itself to take the case to the jury, was some evidence of negligence. A physician, continued the court, who undertakes an operation on a patient is not justified, after such operation, in ceasing to attend the patient while further care and treatment are necessary. Furthermore, there are instances where facts alone prove the negligence and where it is unnecessary to have the opinions of persons skilled in the particular science to show unskilled or negligent treatment. Nor is it necessary that a case of malpractice be proved by direct and positive evidence. It may be proved by a chain of circumstances from which the ultimate fact required to be established is reasonably and naturally inferable. The evidence, in the opinion of the court, created such a chain of circumstances in this case.

Accordingly the Supreme Court of Washington, in a five to four decision, reversed the judgment and remanded the cause to the trial court with directions to enter a judgment on the verdict for the patient.—*Gross v. Partlow (Wash.), 68 P. (2d) 1034.*

Accident Insurance: Death from Overdose of Barbital.—Where an insured, the Supreme Court of Kansas holds, takes barbital without suicidal intent, intending to take the quantity that he does take but in ignorance of the fact that the amount taken is lethal, and dies therefrom, his death results from accidental means within the meaning of an insurance policy providing double indemnity if death results "solely from bodily injuries caused directly, exclusively, and independently of all other causes by external, violent, and purely accidental means."—*Spence v. Equitable Life Assur. Soc. of United States (Kan.), 69 P. (2d) 713.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Mobile, Apr. 19-21. Dr. D. L. Cannon, 519 Dexter Ave., Montgomery, Secretary.
American Academy of Pediatrics, Del Monte, Calif., June 9-11. Dr. Clifford G. Grulee, 636 Church St., Evanston, Ill., Secretary.
American Association of Genito-Urinary Surgeons, Atlantic City, N. J., May 2-4. Dr. Henry L. Sanford, 1621 Euclid Ave., Cleveland, Secretary.
American Association of Industrial Physicians and Surgeons, Chicago, June 6-9. Dr. Volney S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.
American Association of Pathologists and Bacteriologists, Atlantic City, N. J., May 3-4. Dr. Howard T. Karsner, 2085 Adelbert Road, Cleveland, Secretary.
American Association of the History of Medicine, Atlantic City, N. J., May 2. Dr. E. J. G. Beardsley, 1919 Spruce St., Philadelphia, Secretary.
American Association on Mental Deficiency, Richmond, Va., Apr. 20-23. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
American Bronchoscopic Society, Atlantic City, N. J., Apr. 30. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.
American Dermatological Association, Del Monte, Calif., June 9-11. Dr. Fred D. Weidman, 36 Hamilton Walk, Philadelphia, Secretary.
American Gastro-Enterological Association, Atlantic City, N. J., May 2-3. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.
American Gynecological Society, Asheville, N. C., May 30-June 1. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.
American Laryngological Association, Atlantic City, N. J., May 2-4. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.
American Laryngological, Rhinological and Otological Society, Atlantic City, N. J., Apr. 27-29. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
American Neurological Association, Atlantic City, N. J., May 2-6. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
American Ophthalmological Society, San Francisco, June 9-11. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.
American Orthopedic Association, Atlantic City, N. J., May 3-5. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.
American Pediatric Society, Bolton Landing, N. Y., June 9-11. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.
American Proctologic Society, San Francisco, June 11-13. Dr. Curtice Rosser, 710 Medical Arts Bldg., Dallas, Texas, Secretary.
American Psychiatric Association, San Francisco, June 6-10. Dr. W. C. Sandy, State Education Bldg., Harrisburg, Pa., Secretary.
American Society for Clinical Investigation, Atlantic City, N. J., May 2. Dr. J. M. Hayman Jr., 2065 Adelbert Road, Cleveland, Secretary.
American Society of Clinical Pathologists, San Francisco, June 9-11. Dr. A. S. Giordano, 531 North Main St., South Bend, Ind., Secretary.
American Surgical Association, Atlantic City, N. J., May 2-4. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.
Arizona State Medical Association, Tucson, Apr. 21-23. Dr. D. F. Harbridge, 15 East Monroe St., Phoenix, Secretary.
Arkansas Medical Society, Texarkana, Apr. 18-20. Dr. W. R. Brooksher, 602 Garrison Ave., Ft. Smith, Secretary.
Association for the Study of Allergy, San Francisco, June 9-10. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.
Association of American Physicians, Atlantic City, N. J., May 3-5. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.
California Medical Association, Pasadena, May 9-12. Dr. F. C. Warnshuis, 450 Sutter Street, San Francisco, Secretary.
Congress of American Physicians and Surgeons, Atlantic City, N. J., May 3-4. Dr. John T. King Jr., 1210 Eutaw Place, Baltimore, Secretary.
Connecticut State Medical Society, Groton, June 1-2. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.
District of Columbia, Medical Society of the, Washington, May 4-5. Dr. C. B. Conklin, 1718 M St. N.W., Washington, Secretary.
Florida Medical Association, Miami, May 9-11. Dr. Shaler Richardson, 111 W. Jacksonville St., Secretary.
Georgia, Medical Association of, Augusta, Apr. 26-29. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.
Hawaii Territorial Medical Association, Honolulu, May 20-22. Dr. Douglas B. Bell, Dillingham Bldg., Honolulu, Secretary.
Illinois State Medical Society, Springfield, May 17-19. Dr. Harold M. Camp, Lahl Bldg., Monmouth, Secretary.
Iowa State Medical Society, Des Moines, May 11-13. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.
Kansas Medical Society, Wichita, May 9-12. Mr. C. G. Munns, 112 West Sixth St., Topeka, Executive Secretary.
Louisiana State Medical Society, New Orleans, May 2-4. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.
Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 26-27. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.
Massachusetts Medical Society, Boston, May 31-June 2. Dr. Alexander S. Begg, 8 The Fenway, Boston, Secretary.
Mississippi State Medical Association, Jackson, Apr. 19-21. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.
Missouri State Medical Association, Jefferson City, May 2-4. Dr. E. J. Goodwin, 634 N. Grand Blvd., St. Louis, Secretary.
Nebraska State Medical Association, Lincoln, Apr. 26-28. Dr. R. B. Adams, Center-McKinley Bldg., Lincoln, Secretary.
New Hampshire Medical Society, Manchester, May 17-18. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.
New Jersey, Medical Society of, Atlantic City, May 17-19. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.
New Mexico Medical Society, Santa Fe, June 6-8. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.
New York, Medical Society of the State of, New York, May 9-12. Dr. Peter Irving, 2 East 103d St., New York, Secretary.
North Carolina, Medical Society of the State of, Pinehurst, May 2-4. Dr. T. W. M. Long, Roanoke Rapids, Secretary.
North Dakota State Medical Association, Bismarck, May 16-18. Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.
Ohio State Medical Association, Columbus, May 11-12. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.
Oklahoma State Medical Association, Muskogee, May 9-11. Dr. L. S. Willour, Third and Seminole, McAlester, Secretary.

V 11
1938

Philippine Islands Medical Association, Zamboanga City, Apr. 27-29. Dr. A. S. Fernando, 817 Taft Ave., Manila, Secretary.
Rhode Island Medical Society, Providence, June 1-2. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.
Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 30. Dr. W. C. Spain, 116 East 53d St., New York, Secretary.
South Carolina Medical Association, Myrtle Beach, May 17-19. Dr. E. A. Hines, Seneca, Secretary.
South Dakota State Medical Association, Huron, May 9-11. Dr. Clarence E. Sherwood, 102½ Egan Ave. S., Madison, Secretary.
Texas, State Medical Association of, Galveston, May 9-12. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Archives of Internal Medicine, Chicago

61: 161-370 (Feb.) 1938

*Fatal Rheumatic Fever. E. F. Bland and T. D. Jones, Boston.—p. 161.
Atypical Facial Neuralgia: Analysis of 200 Cases. M. A. Glaser and H. M. Beerman, Los Angeles.—p. 172.
Effect of Experimental Cardiac Infarction on Response to Digitalis. Janet Travell, H. Gold and W. Modell, New York.—p. 184.
*Subcutaneous Administration of Oxygen. T. Simpson, Leeds, England, and M. H. Barker, Chicago.—p. 198.
Role of Anoxia in Production of Epileptiform Seizures with Studies of Acid-Base Equilibrium. T. Simpson, Leeds, England, and M. H. Barker, Chicago.—p. 208.
Congenital Defects of Pericardium. H. Southworth and C. S. Stevenson, Baltimore.—p. 223.
Four Lead Electrocardiogram in Cases of Recent Coronary Occlusion. A. Bohning and L. N. Katz, Chicago.—p. 241.
Fever Induced by Intravenous Injection of Typhoid-Paratyphoid Vaccine. S. W. Ranson Jr., New York.—p. 285.
Diseases of Metabolism and Nutrition: Review of Certain Recent Contributions. R. M. Wilder, Rochester, Minn., and D. L. Wilbur, San Francisco.—p. 297.

Fatal Rheumatic Fever.—Bland and Jones state that since 1921 about 1,500 children and adolescents less than 21 years of age have received hospital care at the House of the Good Samaritan for rheumatic fever and chorea. Data relevant to the 306 patients who have died are presented. Postmortem examination was made in seventy-four instances. The following conclusions are cited: 1. Rheumatic fever has been the principal cause of death and was directly responsible for the fatal issue in 250 instances (82 per cent). 2. The early years after the onset of the disease have proved to be a critical period. In approximately half (47 per cent) of the fatal cases death occurred during the first three years and in two thirds (62 per cent) during the initial five years. 3. Thereafter the extent of residual cardiac enlargement (dilatation) and, to a lesser degree, the rapidity with which it developed have served as the most reliable criteria of the severity of the preceding infection as well as an index of the future susceptibility of the individual patient to subsequent fatal rheumatic fever. 4. The age of the patient at the time of onset of rheumatic fever (or chorea) during the first fifteen years of life has been of no significance so far as subsequent longevity is concerned. 5. The manifestations of fatal rheumatic fever have been stressed and contrasted with the generally accepted clinical picture of the disease.

Subcutaneous Administration of Oxygen.—Simpson and Barker observed the results of prolonged anoxia in thirteen epileptic patients who lived in rooms and were able to walk about and converse with their neighbors. The air breathed was under control as to humidity, temperature and oxygen content. The oxygen content of the inspired air was reduced gradually over the course of thirty-six hours in twelve cases. During the first thirty hours the average oxygen content of the air was 13.5 per cent, and in the subsequent six hours it was lowered to a level that was thought safe for the particular patient, from 7 to 9 per cent. The preliminary gradual induction of anoxia was used to prevent the undesirable effects of "mountain sickness." In no instance was a typical epileptiform seizure observed. To satisfy themselves that the presence of excess bromide in the blood of these patients (they were all under bromide therapy up to a few days before the tests were carried out) was not a factor in the suppression of seizures, the authors estimated the bromide content of the blood of every patient when he entered the chamber. In only two cases was the bromide level sufficiently high to have prevented spontaneous convulsions. In the remainder it was so low that it could not be detected by the Wuth method. The reaction of these patients to anoxia, as judged by the symptomatology and acid-base balance, was the same as one would expect and in no way differed from that of normal persons or of control dogs. The authors feel that the effect of anoxia by itself on epileptic subjects under ideal conditions is not a factor in the production of seizures.

Delaware State Medical Journal, Wilmington

10: 19-32 (Feb.) 1938

*Some of the More Uncommon Visceral Manifestations of Syphilis. G. M. Piersol, Philadelphia.—p. 19.
The Syphilitic with Negative Wassermann. F. J. Eichenlaub, Washington, D. C.—p. 24.

Visceral Manifestations of Syphilis.—Although syphilis of the lungs, stomach and kidneys is relatively infrequent, it is of definite clinical importance nevertheless and its diagnosis may be readily overlooked unless the possibility of its occurrence is kept in mind. The three types of changes seen in acquired pulmonary syphilis, as stated by Piersol, are gummas, areas of consolidation and catarrhal inflammation and chronic fibrosis. The diagnosis of pulmonary syphilis is difficult and is usually arrived at by exclusion. Cases of this kind are nearly always looked on as instances of tuberculosis, especially if the lesion happens to be apical. In arriving at the diagnosis of pulmonary syphilis, the following criteria are of some value: The patient presents other evidences of syphilis; the lesion is limited to the root or base of the lung; repeated and careful sputum examinations carried out over a considerable period must be consistently negative for tubercle bacilli; the Wassermann reaction must be definitely positive. Although gastric symptoms are exceedingly common in syphilis, actual syphilis of the stomach is uncommon. Before the diagnosis of gastric syphilis is made it should be borne in mind that gastric lesions of nonspecific origin frequently exist in persons who give a positive Wassermann reaction. The most positive proof of the existence of syphilis of the stomach is histologic and bacteriologic. The diagnosis of gastric syphilis rests on a combination of clinical features, in conjunction with characteristic roentgenologic observations, a positive Wassermann reaction, a positive therapeutic test and on microscopic and bacteriologic examinations. The types of gastric syphilitic lesions are diffuse syphilitic gastritis, syphilitic ulcers and gastric gumma. Syphilis of the kidney may manifest itself in congenital syphilis as well as in the course of early or late acquired syphilis. Spirochaeta pallida is capable of inducing characteristic renal lesions, and a true syphilitic nephritis does exist. The invasion of the kidney by the specific organism of syphilis cannot be denied and it is not unreasonable to believe that the kidney may suffer definite damage. Acquired renal syphilis, acute syphilitic nephritis and chronic renal syphilis have been observed.

Indiana State Medical Assn. Journal, Indianapolis

31: 49-110 (Feb.) 1938

Survey of Syphilis in Indianapolis. F. M. Gastineau, Indianapolis.—p. 49.
*Blood Pictures of Patients with Intestinal Disease. J. A. Bargen, Rochester, Minn.—p. 52.
Orbital Tumors. D. A. Bartley, Indianapolis.—p. 57.
Cecum Lignum. H. D. Caylor, Bluffton.—p. 62.
Foreign Body Impacted in Rectum: Case Report. W. B. Challman, Mount Vernon.—p. 65.
Chronic Ulcerative Colitis. E. L. Cartwright, Fort Wayne.—p. 66.
The Physician's Collateral Reading. E. F. Kiser, Indianapolis.—p. 70.
Proper Prescribing. E. C. Denny, Milton.—p. 75.

Blood Pictures of Patients with Intestinal Disease.—Bargen discusses cases that illustrate types of pathologic processes that occur in the large intestine; in some, rather definite changes were found in the blood, and in others, in which the

110
938

patients were seemingly as ill or more ill, there were no demonstrable changes in the blood. These two groups of cases are compared according to the type of management and progress of the patient. In two cases of severe septic type of thrombo-ulcerative colitis there occurred an identical blood picture, although in one case the history was of two years' duration and in the other only six weeks. The two patients were similarly ill, as far as degree of sepsis was concerned. Both patients recovered. One patient has been in good health for more than five years; the other, for a year. The blood picture was that of a hemoglobin deficiency type of anemia associated with reduction in the total number of erythrocytes and a relatively normal number of leukocytes, but the striking thing about the differential count was the marked shift to the left of polymorphonuclear leukocytes. The great predominance of nonfilamented polymorphonuclear cells was also noteworthy. Some instances have occurred in which all the leukocytes, and frequently nearly all, have been nonfilamented polymorphonuclear leukocytes. In a case of hemorrhagic thrombo-ulcerative colitis the tendency toward hemorrhage was striking. Literally, bedpanfuls of blood were passed and a very low content of vitamin C was found in the plasma. The marked reduction in excretion of vitamin C was noteworthy. The average normal content of vitamin C in the plasma has been recorded as 1 mg. and excretion in the urine as 20 in a twenty-four hour specimen. Case 4 (chronic thrombo-ulcerative colitis with colonic scarring) is illustrative of the first type of chronic ulcerative colitis, in which the disease has burned itself out and, while much damage of the intestine has occurred previously, the present difficulty is largely a mechanical one. The blood picture was essentially normal in spite of a constant, severe diarrhea, to the extent of fifteen to twenty evacuations daily for two years. In a case of regional ileocolitis the blood picture was essentially normal in spite of severe obstructive disease at the ileocecal junction. The disease was inflammatory in nature and was associated with much scar tissue. In a case of diffuse polyposis, in spite of continuous diarrhea and severe bleeding from a polypoid mucous membrane for a year, no changes in the blood picture could be detected. Case 7 represents the timeworn story of anemia associated with carcinoma of the right side of the colon and case 8 illustrates that this type of anemia has been mistaken frequently for pernicious anemia. A case of actinomycosis of the sigmoid illustrates another type of blood picture commonly found in various types of severe, long standing, perforating lesions of the colon. There was a persistent leukocytosis without the marked toxic features as expressed in other cases by the ratio of filamented to nonfilamented forms of the polymorphonuclear neutrophilic leukocytes. The high sedimentation rate of erythrocytes was also noteworthy. The severity of the disease was well illustrated by its prolonged course and by the appearance of the roentgenograms. The cases illustrate that in at least two major lesions of the intestine there is associated rather a characteristic blood picture. While the extent of changes in the blood varies in patients who have thrombo-ulcerative colitis, in the main the picture is quite characteristic. So, too, when there is a change in the blood picture in persons who have cancer of the right side of the colon, it is rather characteristic.

Kansas Medical Society Journal, Topeka

39: 45-88 (Feb.) 1938

*Progressive Postoperative Gangrene of Abdominal Wall. A. E. Hiebert, Wichita.—p. 45.
Psychiatry in General Practice. L. G. Little, Wichita.—p. 47.
Minimal Case Finding in Pulmonary Tuberculosis. C. F. Taylor, Norton. —p. 52.
Cooperation Between the State Medical and Pharmacy Boards. W. Varnum, Lawrence.—p. 55.
Action of Eserine Administration During Homatropine-Benzedrine Cycloplegia. L. S. Powell, Lawrence, and M. E. Hyde, Osawatomie.—p. 57.

Progressive Postoperative Gangrene of the Abdominal Wall.—Since most septic operative wounds of the abdominal wall are amenable to ordinary treatment, and progressive postoperative gangrene of the abdominal wall is rather rare in the experience of the average surgeon and its early recognition and treatment are important, Hiebert lists the main features of this now apparently established clinical entity: progressive necrosis about an operative abdominal wound, which does not respond to the ordinary methods of treatment; severe local pain and tenderness; slight rise in temperature or leukocytic reaction; general mental depression of the patient. The etiologic organisms are streptococci and staphylococci. Treatment short of complete cautery excision of the entire lesion is likely to be inadequate.

New England Journal of Medicine, Boston

218: 205-246 (Feb. 3) 1938

*Useful Type of Light, Waterproof Cast: Preliminary Report. A. Thorndike Jr. and W. E. Garrey, Boston.—p. 205.
Surgical Treatment of Abdominal Fistulas. S. F. Marshall and F. H. Lahey, Boston.—p. 211.
Early Diagnosis of Schizophrenia by the General Practitioner. D. E. Cameron, Worcester, Mass.—p. 221.
Social Security and the Physician. C. A. Sparrow, Worcester, Mass. —p. 225.

A Light, Waterproof Cast.—Thorndike and Garrey state that the makers of cellulose products have developed a very hard, light, waterproof material for making box toes for shoes: adding boric acid to the cellulose compound rendered it but little more inflammable, when dry, than wood. The hard box toes were produced by molding a fabric impregnated with this compound while it was moistened with a solvent. Using this somewhat crude material, the authors constructed a satisfactory cast for a patient, who wore it daily in the water for five weeks. Numerous trials were carried out by impregnating various fabrics with the compound. The present most acceptable product is rolled, tinted, unbleached cotton sheeting, cut on the bias in widths of 2 and 3 inches and supplied in lengths of 10 yards. These bandages, correctly moistened with the quick-drying solvent, are supplied in hermetically sealed cans. The casts made from this material are far lighter than plaster, extremely hard, waterproof and pervious to x-rays. The cast takes on the average from thirty to forty minutes to harden sufficiently for the patient to be dismissed, and a longer time before it cannot be indented. The authors have used this material to make numerous casts for the upper extremities, both molded and circular, for fractures of the carpal bones, Colles' fracture and fractures of both bones of the forearm and to make three shoulder spicas for fractured humeri. The method of application is similar to that adopted with plaster-of-paris bandage, except that only three thicknesses are required; in certain areas of long or bulky casts, however, additional reinforcing slabs or circular layers may be required to counteract stresses or strains. This product has one especial advantage: should the cast crack at any point it can be mended with additional lacquer (solvent) and bandage. In applying the casts, drying will be facilitated by placing three layers of gauze bandage over the skin or by using stockinet. The danger of applying the cast too tightly and not allowing for shrinkage is emphasized; this danger has been minimized by providing an impregnated cloth cut on the bias. Lamination may be prevented by painting the cast with some of the cellulose acetate lacquer (supplied in separate cans) the day after its application.

New Orleans Medical and Surgical Journal

90: 445-510 (Feb.) 1938

Treatment of Cancer and Precancerous Lesions of Vulva. O. C. Rigby, Shreveport, La.—p. 445.
Treatment of Carcinoma of the Prostate. E. B. Vickery, New Orleans. —p. 452.
Congenital Malformations of Rectum and Anus as Cause of Constipation. C. H. Webb, Shreveport, La.—p. 457.
Septicemia in Children: Report of Five Cases with Review of Literature on Therapy. R. Talbot, Monroe, La.—p. 463.
Factors Delaying Diagnosis of Pulmonary Tuberculosis. L. A. Monte and O. Blitz, New Orleans.—p. 468.
Bedside Diagnosis and Treatment of Cardiac Emergencies. B. R. Heninger, New Orleans.—p. 475.
*Fatal Tularemia with Postmortem Examination. W. R. Mathews, Shreveport, La.—p. 479.
Surgical Intervention in Acute Laryngeal Obstruction. C. B. Flinn, Monroe, La.—p. 489.

Fatal Tularemia.—Mathews reports three fatal cases of tularemia in which postmortem examinations were done. He summarizes the chief features of seven additional cases in which postmortem studies were made, which were not included in the review of the twenty-one cases made by Bernstein in 1935. The gravity of clinical signs of pulmonary involvement in the course

of tularemia is emphasized by the fact that lesions of the lungs were present in twenty-four of the cases examined post mortem. The type of pulmonary lesion has varied, described as lobar pneumonia, abscess, cavitation and pleurisy with or without effusion. In earlier studies of necropsy material only the caseous lesions were considered to be due to tularemia. The outlying and more diffuse pneumonic patches were interpreted as secondary bronchopneumonia. More recently the demonstration of Bacterium tularense in the pulmonary exudate has furnished strong support for the view that the exudative pneumonia, as well as the caseous, is due to the tularemic infection. The author was able to stain bacteria, morphologically consistent with Bacterium tularense, in the pulmonary exudate of only his first case. Notwithstanding the indication that all types of pulmonary lesions in tularemic infection are due to this cause, it should be emphasized that a coexistent bronchopneumonia of other bacterial origin may be present, as was illustrated in one of Bernstein's cases. Attention has repeatedly been called to the resemblance of pulmonary tularemia to pulmonary tuberculosis. It is likely at times that pulmonary tularemia has been mistaken for tuberculosis. The microscopic changes closely resemble tuberculous caseous pneumonia except that they do not suggest distribution by aspiration. Tularemic involvement of the central nervous system is not an unimportant feature of the visceral pathologic changes. The postmortem data indicate that the most common sites of tularemic lesions are the skin, lymph nodes, lungs, spleen and liver. Isolated examples of tularemic lesions have been recorded in practically all the organs.

New York State Journal of Medicine, New York

38: 245-322 (Feb. 15) 1938

Antipneumococcus Rabbit Serum as Therapeutic Agent in Lobar Pneumonia: II. Additional Observations in Pneumococcic Pneumonias of Nine Different Types. F. L. Horsfall Jr., K. Goodner and C. M. MacLeod, New York.—p. 245.
Incontinence of Urine in the Female: Study of Urethral Sphincter Under Hydrostatic Pressure with Roentgenograms—Sphincter Mechanism, Loss of Control, Restoration. W. T. Kennedy, New York.—p. 256.
The Prospective Outside Plant Employee: Practical Brief Physical Appraisal. E. S. McSweeny, New York.—p. 262.
Transfusions: Preliminary Study. L. N. Sussman, New York.—p. 265.
Cancer of Rectum and Rectosigmoid. J. M. Lynch, New York.—p. 268.
Surgical Moving Pictures in Color: The Problem of Lighting. B. M. Bosworth, New York.—p. 273.
Public Health Aspects of Mental Hygiene. F. W. Parsons, Albany.—p. 275.

Philippine Islands Med. Association Journal, Manila

18: 1-58 (Jan.) 1938

Severe Abdominal Pain as an Unusual Manifestation of Rheumatic Infection. A. G. Sison and G. F. Austria, Manila.—p. 1.
Subdiaphragmatic Abscess: Report of Case. A. B. M. Sison, P. Chikiamco and J. Z. S. Cruz, Manila.—p. 7.
Ovarian Conditions Giving Rise to Symptoms of Acute Abdomen. E. V. de los Santos, Manila.—p. 17.
Maternal Mortality in the Philippines During the Years 1925-1936. H. Zwingli, Manila.—p. 23.

Public Health Reports, Washington, D. C.

53: 281-328 (Feb. 25) 1938

*Selenium as Potential Industrial Hazard. H. C. Dudley.—p. 281.
Acute Response of Guinea Pigs to Inhalation of Methyl Isobutyl Ketone. H. Specht.—p. 292.
*Quality of Drinking Water on Trains: Note. A. P. Miller and E. C. Garthe.—p. 300.

Selenium as Potential Industrial Hazard.—Dudley lists the industries which may have unrecognized hazards due to the processing of selenium-bearing materials. They are those engaged in glass decolorization; production of ruby glass, red and yellow glazes and paint and ink pigments; production and coloring of plastics; alloying of machinable stainless steels and free machining of copper base alloys; production of rubber "accelerators" and antioxidants; fireproofing of electric cable, and making photo-electric apparatus and chemicals.

Quality of Drinking Water on Trains.—From Sept. 14, 1936, to Feb. 15, 1937, Miller and Garthe had 1,090 samples of drinking water from coolers and other containers on trains operating in interstate traffic collected by trained men under the supervision of Interstate Sanitary District 1 at two large terminals in New York City and three smaller ones in Hoboken and Jersey City, N. J. Samples were taken from all types of cars and trains without any attempt to be selective. Samples showing three or more 10 cc. tubes positive for the coli-aerogenes group were considered as unsatisfactory. Along with the determination of organisms of this group the total bacteria per milliliter growing on agar at 37 C. was obtained. At no time did more than two hours elapse between the collection and testing of a sample. The percentages of samples showing three or more 10 cc. tubes positive for coli-aerogenes for railroads 1 and 3 are considerably higher than for all others except 4, and the percentages of all three of these roads are in excess of the average for all samples tested, two of them considerably so. It is known that the sources of water supplying these lines are satisfactory, and that, if the water is safely handled, it should reach the consumers in good condition. Therefore, these results indicate that at least two of the railroads are inefficiently cleaning the containers on their cars or are handling the water after it leaves the supplying municipality's system in such a careless and insanitary fashion as to permit contamination.

Rhode Island Medical Journal, Providence

21: 21-40 (Feb.) 1938

Toward the Prevention of Mental Disease. A. H. Ruggles, Providence.—p. 21.
The New State Hospital for Mental Diseases. S. F. H. Howes, Howard.—p. 23.
Practical Management of Convulsive Disorders in Childhood. C. Bradley, East Providence.—p. 27.
Neglect of Elementary Body Functions: Source of Personality Maladjustment. H. W. Williams, C. Rupp and Kathryn Schultz, Howard.—p. 29.
Insulin Shock Treatment in Schizophrenia. H. E. Kiene, Providence.—p. 32.
The Providence Child Guidance Clinic. Evelyn Alpern, Providence.—p. 35.

Wisconsin Medical Journal, Madison

37: 85-176 (Feb.) 1938

Clinical Use of Protamine Zinc Insulin. C. C. Edmondson, Waukesha.—p. 101.
The Family Physician's Role in Preventive Medicine. F. G. Johnson, Iron River.—p. 107.
Acute Leukemia in Childhood: Analysis of Sixteen Cases. L. M. Simonson, Sheboygan.—p. 110.
The Dystrophies of Childhood. M. G. Peterman, Milwaukee.—p. 112.
Protractor for Use in Nailing Fractured Neck of Femur. J. C. Dean, Madison.—p. 115.
Clinical Use of Blood Tests for Syphilis. W. F. Lorenz, Madison.—p. 117.
*Nonvenereal Vaginitis. E. L. Cornell, Chicago.—p. 123.

Nonvenereal Vaginitis.—Cornell suggests the following treatment for nonvenereal vaginitis (Trichomonas vaginalis vaginitis): He prescribes 100 tablets of a preparation containing acetarsone (Devegan) and instructs the patient to insert one tablet in the vagina nightly after retiring. The patient is warned against having sexual intercourse throughout the course of treatment unless a condom is used. She is not to take douches. She should keep the labia clean by frequent washing, since the tablet disintegrates and is discharged from the vagina. If allowed to dry on the hair, it is difficult to remove. The patient is to return to the office on the first, third and fifth day of her menstrual period. At this time the menstrual secretions are cleaned out and three or four tablets are inserted into the upper part of the vaginal vault. When the period is finished, the patient may resume home treatment. After the fourth menstrual period the home treatment is discontinued, but the patient is to return to the office one week after she stops flowing. The secretions at this time are cleaned out and, if Trichomonas vaginalis is not found, the patient is instructed to return in ten days for a retest. If the test is negative again, the patient returns again after her next menstrual period for another test. The patient is considered cured if no evidence of Trichomonas vaginalis is found on this visit. If a patient who has finished the course of treatment and has been pronounced cured suffers a recurrence of vaginitis following sexual intercourse without the use of the condom, the husband should be considered a trichomonas carrier even though the organism is not found in his prostatic secretions. He should be given treatment. The woman should be treated in the same manner as before for at least two or three months and retested thereafter.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Radiology, London

11: 65-128 (Feb.) 1938

Etiology of Bronchiectasis, with Especial Reference to Pulmonary Atelectasis. F. P. L. Lander and M. Davidson.—p. 65.
X-Ray Evidence of Healing in Peptic Ulceration. J. R. Wylie.—p. 90.
Wavelength as Factor in Radiotherapy. J. H. D. Webster.—p. 108.
Physical Factors of New Four-Gram Radium Unit Now in Use at the Westminster Hospital Radium Annex. H. T. Flint and C. W. Wilson.—p. 112.
Rectangular Nozzle for Use in Radium Beam Therapy: Comparison of Ionization Currents Produced by Gamma Rays in Elektron Metal and Celluloid Ionization Chambers. W. H. Rann.—p. 122.

British Medical Journal, London

1: 215-264 (Jan. 29) 1938

Pathology of Adolescent Scoliosis. R. G. Abercrombie.—p. 215.
Outbreak of Paratyphoid and Dysentery in a Training Ship. E. R. Peirce.—p. 217.
Recurrent Hematemesis in "Banti's Disease." R. Kemp.—p. 222.
*Association of Trauma with Progressive Muscular Atrophy. G. E. F. Sutton.—p. 225.
Etiology of Acute Appendicitis. A. M. Spencer.—p. 227.
Massive Spontaneous Intraperitoneal Hemorrhage. M. Silverstone.—p. 230.

Trauma and Progressive Muscular Atrophy.—Little is known about the etiology of progressive muscular atrophy, but its association with trauma in a small percentage of cases has been described by eminent neurologists during the past decade. These authors divide such atrophies into different groups: muscular atrophy localized to the region of the muscles in the neighborhood of the injured joint, amyotrophy ensuing rapidly on the injury and developing on a paralytic background and slowly developing wasting preceded by any notable paralytic phenomenon and not associated with sensory troubles or reflex abnormalities. Sutton states that from 1925 to 1934 thirty-one cases of progressive muscular atrophy were admitted to the Bristol Royal Infirmary, and in only three of these do the case notes include a history of injury. It is probable that this number would have been higher but for the fact that many physicians do not inquire about a previous history of injury in such cases because the importance of this is not recognized. There is no evidence in favor of the idea that trauma merely "pulls the trigger" in cases in which there is a congenital predisposition, nor is there any practical support for the suggestion by Thiemn that an ascending neuritis occurs which ultimately involves the anterior horn cells and so produces the muscular atrophy. Localized reflex wasting after injuries of bones and joints is an entirely different condition. The problem here is one of widespread progressive muscular atrophy developing in some cases years after a severe injury. It seems to the author that one is bound to assume that a molecular disturbance of the brain or cord is occasioned by the injury. A mysterious feature of the disease is the lack of correspondence between the pathologic process and the symptomatology. It is possible, therefore, that degeneration of the Betz cells in the cortex and of the anterior horn cells in the cord may occur some years after the injury before clinical signs become manifest. There is evidence that trauma is a definite etiologic factor in some cases of progressive muscular atrophy.

East African Medical Journal, Nairobi

14: 311-350 (Jan.) 1938

Medical Progress 1936-1937. R. Hutchison.—p. 311.
*Infantile Edema: Treatment by Adrenalin. D. Bell.—p. 327.
Study of Sex Ratio in Ulanga, Tanganyika Territory. A. T. Culwick, G. M. Culwick and R. W. Jackson.—p. 331.
Achondroplasia. H. L. Gordon.—p. 346.

Infantile Edema.—From April to October 1937 thirteen children with infantile edema were admitted to the Native Hospital, Kiambu. All were between the age of 1 and 4 years, eight were boys and five girls and all were African children from the Kiambu native reserve. The chief symptoms, according to Bell, were generalized edema in all cases with one exception, depigmentation of the hair in all cases, photophobia in six cases and rashes in all. In several boys the penis and scrotum were so swollen as to interfere with micturition. The children all whined and moaned and resented being handled, being content to lie still, covered up with a sheet or blanket. No definite history of the onset of the disease could be obtained. In nine of the cases marked enlargement of the abdomen was noted. Coryza was observed in six cases, septic skin rashes in seven, ulceration of the penis and vulva in five cases. The blood in all cases showed anemia. Of the thirteen patients, one died six hours after admission, three went home slightly improved and nine were "cured." All the patients were treated with one-half drachm (2 Gm.) of an autolyzed yeast preparation three times a day, tomatoes, orange juice and cod liver oil, with milk, beans and gruel. Three patients received this treatment only and the remaining ten were treated (in addition) by daily injections of 2 or 3 minims (0.15 cc.) of liquid epinephrine hydrochloride injected subcutaneously. Of the ten patients so treated one died after admission, but the remaining nine showed marked improvement in a short time; most of them after five injections were running about the ward and playing in the hospital grounds like normal children. In ten days most of the edema regressed; the skin all but returned to normal if slightly lighter in color and was a little more patchy than normal. The hair too in most cases became stronger, curly and dark. The hemoglobin average was now 70 per cent and the stools were improved. The improvement in the three cases treated without epinephrine was slight and in no way resembled the results obtained with it.

Edinburgh Medical Journal

45: 73-160 (Feb.) 1938

Disorders of Interstitial Circulation. W. T. Ritchie.—p. 73.
Queer Patients: Some Notes on Artefacts. R. C. Low.—p. 88.
Chronic Nutritional Hypochromic Anemia. L. S. P. Davidson and H. W. Fullerton.—p. 102.
Neuropsychologic Basis of Conduct Disorder. R. G. Gordon.—p. 132.

Indian Medical Gazette, Calcutta

73: 1-64 (Jan.) 1938

Sternum Puncture: I. Findings in Normal Indians. L. E. Napier and P. C. Sen Gupta.—p. 1.
Adult Filarial Worm of Unknown Species Removed from Skin of Human Subject. H. R. Rishworth.—p. 7.
New Filarial Worm from Human Being. P. A. Maplestone.—p. 8.
Some Unusual Joint Lesions. P. N. Ray.—p. 10.
Experiments on Spirillum of Rat-Bite Fever. B. M. Das Gupta.—p. 14.
Siphunculina Funicola (Eye Fly). M. M. Syddiq.—p. 17.
*Myeloid Leukemia Treated by Deep X-Ray Therapy. S. M. K. Mallick, S. Ali and B. Singh.—p. 19.
Some Recent Advances in Surgery. J. B. Hance.—p. 21.
Management of Head Injury Cases in Rural Practice. P. C. Dutta.—p. 26.

Myeloid Leukemia Treated by High Voltage Roentgen Therapy.—Mallick and his co-workers cite a case of chronic myeloid leukemia which has been greatly benefited by high voltage roentgen therapy. There are two points at issue in this case: whether tuberculosis bears any relationship to this disease, for it has been noticed more than once that in some of these cases in which an earlier tuberculous infection has been overcome by rest and treatment myeloid leukemia developed later on, and whether the beneficial effect in this case was brought about only by exposure mainly of the bones. The x-ray exposure directly affects the hemopoietic tissue and thereby checks its malignant activity. This explains the benefit only in the present case but fails to explain the achievements of other clinicians whose patients have benefited from either exposure of the spleen alone or by exposure of the whole body, alternately ventral and dorsal sides, without especially taking up the bones or the splenic region. Milani believes that though the reduction in the number of white cells is the most apparent phenomenon, it is not the fundamental one in the mechanism of improvement. This destruction occurs in crisis analogous to that occurring in the spontaneous leukocytic crisis in all leukemias, the difference being that in those which occur after treatment the x-rays provoke a leukocytic increase, which in turn provokes the crisis of destruction. He gives figures by taking daily white counts and proves how after a marked rise in leukocytes a sudden crisis, which greatly reduces the count, occurs. To Isaacs it appears that the good effect of high voltage roentgen therapy is due to stimulation of the formation of leukocytes and their maturation, which subsequently ends in complete destruction of the mature cells.

V 11
1938

Annales de Médecine, Paris

43: 85-164 (Feb.) 1938

Glycosuria and Renal Threshold for Sugar. M. Labbé and S. Livieratos. —p. 85.
Tuberculous Ultravirus: Existence not Demonstrated. G. Petragnani. —p. 101.
*Researches on Infantile Erythroblastic Anemia in Peoples of Eastern Mediterranean. J. Caminopetros.—p. 104.
Role of Liver in Modifications of Proteins in Patients with Suppurations. I. Blitstein.—p. 126.
Treatment of Diabetes Mellitus by Means of Diets Rich in Carbohydrates. A. Baisset and C. Darnaud.—p. 138.

Erythroblastic Anemia.—According to Caminopetros, the facts collected so far indicate that erythroblastic anemia occurs especially in the countries of the eastern Mediterranean. It is a familial disorder which attacks children and usually ends in death. The first cases were observed by Cooley among the American-born children of Greek, Italian and Syrian immigrants. This author called attention to a special kind of bone lesion which can be detected in the roentgenologic examination of the skeleton. Since Cooley's report, other cases have been observed in America, always in children of Greek, Italian and Syrian immigrants. Only recently several cases have been described in Mediterranean countries, particularly Italy. In Greece, as in other countries, the disorder is confused with leukemic anemia or the other less acute anemias. The author investigated the incidence of this disorder in Greece. The total number of cases studied by him was thirty-six. He says that, in addition to the characteristics already known (erythroblastosis, Mongolian facies and osseous changes), there is augmentation in the resistance of the erythrocytes. To him this symptom seems so essential for erythroblastic anemia that it alone justifies the diagnosis, just as the diminution of the resistance identifies familial hemolytic disease. He directs attention to roentgenologic changes of the cranium. The fact that these changes and a complete absence of Mongolian facies characterize a number of cases induced him to separate from Cooley's anemia a new form, under the name of anemia of geophagists. Then he directs attention to a form of erythroblastic anemia, characterized by elongated forms of erythrocytes, recalling the sickle-shaped erythrocytes found in anemic Negroes. Finally the author studied a whole series of secondary anemias which, as is proved by their comparison with erythroblastic anemia, is already known under the term of von Jaksch-Luzet's anemia, which is entirely different from primitive erythroblastic anemia. The osseous changes in erythroblastic anemia are absolutely specific. The osseous malformations of the face and cranium result from the disease itself, and thus have to be differentiated from the other characteristics of the Mongolian race. The author points out further that hidden pathologic deficiencies have been detected in the apparently healthy parents and siblings of patients, such as the augmentation in the resistance of the erythrocytes and changes of the bones, two signs of erythroblastic anemia. This fact proves the possibility of a hereditary transmission for this alteration of hemopoiesis. The examination of the resistance of the erythrocytes constitutes a sure method to detect the apparently healthy carriers of the disease among the members of the families of the patients and thus provides a basis for a social prophylaxis, that is, by forbidding procreation. The hereditary transmission was proved also by the identity of blood groups. Malarial therapy is the only therapeutic method by which can be obtained an arrest of the abnormal and excessive functional activity of the hemopoietic system.

Bulletin Médical, Paris

52: 125-138 (Feb. 19) 1938

*Intradermal Injection of Histamine in Treatment of Symptomatic Pains of Chronic Obliterating Arteritis. R. J. Weissenbach and L. Perlès. —p. 127.
Intradermal Injections of Histamine, Procedure of Exploration of Tegumentary Circulation in Surgery of Members. P. Goinard.—p. 128.

Injection of Histamine in Obliterating Arteritis.—Weissenbach and Perlès tried the intradermal injection of histamine, which they had been employing to counteract the pains of the contractures of rheumatism, in the treatment of chronic obliterating arteritis. This seemed justified in view of the antalgic and vasomotor action of histamine. In two cases the results were such that they feel justified in calling attention to this treatment. They employ a solution of histamine bihydrochloride with a content of 0.5 mg. per cubic centimeter. The adaptation of the doses to the individual patients is important, because many of these patients have hypertension and fragile arteries. The dose of 0.5 mg. per injection should never be exceeded. The patients felt relieved at once. The pain in walking was improved after the first treatment and the spontaneous nocturnal pains were relieved the first night after the treatment. The first patient was given five injections in the course of two weeks. The second patient was given two injections during the first week and one injection each during the following three weeks. In both patients the functional improvements persisted long after the treatment. In the first patient, eighteen months has elapsed since the histamine treatment and in the second patient six months, and both are still free from pain.

Arch. Ital. d. Mal. d. App. Diger., Bologna

7: 1-96 (Jan.) 1938

Sprue Nostras of Malignant Evolution. A. Forconi.—p. 1.
*Behavior of Calcemia During Digestion in Relation to Different Grades of Gastric Acidity. C. Cella.—p. 25.
Clinical Study of Six Cases of Choleperitoneum. G. Brendolan.—p. 49.

Behavior of Calcemia During Digestion.—Cella has reported the effects of induced calcemia on gastric acidity and gastric chemism in normal persons and in patients suffering from gastric and extragastric diseases. His article was reported in the *Archivio italiano delle malattie dell'apparato digerente* (**6**:381 [Aug.] 1937; abst. THE JOURNAL Oct., 30, 1937, p. 1494). The author now studies the effects of gastric acidity and gastric chemism on calcemia. He followed the behavior of calcemia during digestion in fifty-one patients suffering from gastroduodenal diseases and in another group having diseases other than gastroduodenal. He concludes that the curves of calcemia and of gastric acidity during digestion follow an independent course in patients who have increased gastric acidity (peptic, duodenal and juxtapyloric ulcers, gastroduodenal stenosis and hyperacid gastritis) and in patients with normal gastric acidity (those with other than gastroduodenal diseases). The curves of calcemia and gastric acidity in patients with diminished gastric acidity and with anachlorhydria, when they are constant during digestion, run parallel to each other. If acidity increases in the gastric secretion of patients who are suffering from anachlorhydria, calcemia diminishes. In the fifty-one patients who had gastroduodenal diseases normal calcemia was found in forty-two cases, increased calcemia in seven and slightly diminished calcemia in two. In the majority of cases, calcemia does not change during digestion. In rare cases there are variations which do not exceed 1.7 mg. of calcium for each hundred cubic centimeters of blood.

Minerva Medica, Turin

1: 145-168 (Feb. 10) 1938

Mechanism of Weltmann's Reaction of Coagulation of Blood Serum: Relation Between Reaction and Proteins in Blood Serum in Pulmonary Tuberculosis. U. De Michelis and E. Massobrio.—p. 155.
*New Factor in Pathogenesis of Chronic Bronchitis in Children and in Development of Pulmonary Tuberculosis. Zula Franzoso Pirani.—p. 158.
*New Method of Homogenization of Search for Tubercle Bacilli in Sputum. A. D'Arienzo.—p. 159.

Diseases of Respiratory Tract.—Franzoso Pirani states that she has found eggs of parasites (ascarides, Trichocephalus and Ancylostoma) in the feces of all children who are suffering from a special type of chronic catarrhal bronchitis, as well as in those of adults who show sudden evolution of latent pulmonary tuberculosis. Bronchitis in these cases is diffused to one or both sides and the patients are anemic and dyspeptic. The roentgen examination of the thorax shows shadows at the hilus of the lung and sometimes adenopathies. Latent tuberculosis develops in one or both lungs. Controlling intestinal parasitism by administering antiparasitic treatment to the patients improves the respiratory diseases and the general condition of the patients. According to the author, intestinal parasitism is the cause of nontuberculous diseases of the respiratory tract and of the development of latent pulmonary tuberculosis. The fact is due

to the biologic cycle of intestinal parasites. The eggs in the intestine are acted on by gastric juices, a process by which the larvae are set free. The latter go through the intestinal wall, portal blood and blood vessels to the lung and pass through the parenchyma of the organ and the respiratory and digestive tracts back to the intestine, where they develop into adult forms. In rare cases the larvae perforate the lung parenchyma through the diaphragmatic pleura. The author emphasizes the importance of the knowledge of the part of intestinal parasitism in the pathogenesis of pulmonary and bronchopulmonary, tuberculous and nontuberculous diseases, especially for the diagnosis, prevention and treatment of the diseases.

Homogeneization of Tubercle Bacilli in Sputum.—D'Arienzo's method is as follows: A solution is prepared with 8 cc. of distilled water, 1.5 cc. of a 1 per cent solution of phenol and 0.5 cc. of ammonium hydrate. Equal parts of the solution and of sputum are mixed, homogenized and placed in an incubator at 37 C. After ten or twelve hours the mixture is centrifugated. The sediment is placed on a glass slide previously covered with serum or with egg albumin and stained with Ziehl-Neelsen's dye. In thirty samples of sputum the author obtained the following results: All the samples gave negative results with the simple method of examination of sputum, twenty of the thirty samples gave positive results for the presence of tubercle bacilli with the method in which a strongly alkaline solution of sodium hypochlorite was used and twenty-three of the thirty samples gave positive results to the author's method. The technic is simple and the method useful.

Prensa Médica Argentina, Buenos Aires

25: 321-376 (Feb. 16) 1938

Treatment of Obstetric Fractures of Humerus and Femur. M. Ruiz Moreno.—p. 321.
Syphilis of Lung: Syphilis and Tuberculosis; Syphilis of Lung and of Larynx. A. A. Rissotto and I. Natin.—p. 331.
*Action of Hypertonic Solution of Sodium Chloride in Acute Pleuropulmonary Diseases. C. A. Videla, A. Saenz and P. Carnevale.—p. 342.
Prevention of Measles. F. Bazan and E. Sujoy.—p. 350.

Sodium Chloride in Pleuropulmonary Diseases.—Videla and his collaborators found that the exudates of serofibrinous pleurisy and the blood of patients suffering from the condition contain an increased amount of sodium chloride (440 mg. and 370 mg. of sodium chloride for each hundred cubic centimeters of exudates and total blood, respectively). The blood of normal persons contains 290 mg. of sodium chloride for each hundred cubic centimeters of blood. The variations of sodium chloride in the pleuritic exudate and in the blood of the patients are in relation to each other. The administration of intravenous injections of hypertonic solution of sodium chloride in daily progressive doses of from 10 to 20 cc. of the solution, up to a total number of from six to nine injections, diminishes the amount of sodium chloride in the pleuritic exudates and in the blood of the patients and stimulates reabsorption of pleurisy in acute pleuropulmonary diseases if pulmonary tuberculosis in evolution is not present. The authors believe that the increase of sodium chloride in the pleuritic exudates and in the blood of the patients shows dysfunction of the tissues in fixing sodium chloride. Satisfactory results of the treatment are reported in five cases.

Klinische Wochenschrift, Berlin

17: 73-112 (Jan. 15) 1938. Partial Index

Functional Test of Heart and Circulation. W. Borgard.—p. 73.
*Increased Sensitivity to Digitalis in Case of Cardiac Impairment. E. Schulze.—p. 75.
Investigations on Treatment of Diabetes Mellitus. B. Schuler.—p. 77.
*Behavior of Meinicke Immunity Reaction in Course of Pulmonary Tuberculosis. K. Spies.—p. 84.
Diuretic Action of Adrenal Cortex. N. Endo.—p. 89.
Comparative Determination by Means of Cuboni Reaction and of Allen-Doisy Test of Estrogenic Action of Urine of Pregnant Mares. I. Andersen and K. Pedersen-Bjergaard.—p. 91.
Prolongation of Systole During Tetany and Its Modification by Various Pharmaceuticals. Nelly Landau.—p. 93.

Sensitivity to Digitalis in Cardiac Impairment.—Schulze points out that Fromherz and Bauer were able to demonstrate that the anatomic lesions in the cardiac muscle which are produced by toxic doses of digitalis are the cause of the increased sensitivity to further medication with digitalis. The author himself had made the observation that hearts which had become impaired by the toxins of diphtheria had an increased sensitivity to the glucosides of digitalis. It seemed justified to assume that it was not the substance causing the lesion but rather the lesion itself which was responsible for the increased sensitivity to digitalis. To gain a better insight into this problem, the author studied the hearts of cats that had been made anemic and then subjected to work tests. These cats, as well as their isolated hearts, show an increased sensitivity to digitalis. On the basis of these experiments and of earlier observations, the author assumes a relationship between the severity of the anatomic lesions in the myocardium and the degree of sensitivity to digitalis.

Meinicke Reaction in Tuberculosis.—Spies reviews the literature on the Meinicke immunity reaction in tuberculosis and reports the results he obtained with this reaction in 252 cases. He found that when the Meinicke reaction was made only once it was positive in 102 cases, or slightly more than 40 per cent. He gained the impression that the positive outcome of the reaction is dependent on a demonstrable excess of antibodies. For this reason the reaction is negative nearly always in early infiltrates, miliary tuberculoses and generalized forms and in the predominating number of cases of severe acute exacerbations and hemorrhagic disseminations. Taking into consideration the outcome of the Meinicke reaction in the course of the tuberculous process, the conclusion is reached that the diagnostic value of the reaction is slight. In extending the serologic examinations over longer periods, it is found that the Meinicke reaction permits only a catamnestic evaluation of the disease process without allowing in most cases an estimation of the further development of the tuberculosis. Only in case of an acute severe exacerbation does the Meinicke reaction run exactly parallel to the course of the disease. The author discusses the present status of the antigen-antibody problem during tuberculosis.

Bibliotek for Læger, Copenhagen

130: 1-35 (Jan.) 1938

Medical Faculty of University of Copenhagen Through Four Hundred Years. G. Norrie.—p. 1.
*Cevitamic Acid in Serum Under Normal and Various Pathologic Conditions. H. E. Nielsen.—p. 20.

Cevitamic Acid in Serum.—For determination of the cevitamic acid in the blood Nielsen used Lund and Lieck's method, based on the decoloration of methylene blue solution under powerful illumination when cevitamic acid is present. In 100 normal persons on ordinary Danish diet examined from April to September the lowest cevitamic acid value in the blood, an average of about 0.30 mg. per hundred cubic centimeters, was found in April and May, and the highest, an average of about 0.40 mg., in September. The Göthlin test is not specific for avitaminosis C and is most significant in cases in which it is positive and becomes negative under treatment with vitamin C. Determinations in April of the cevitamic acid values in forty pregnant and forty-one nonpregnant women in the same age group showed considerably lower values in the first group. Comparative determinations in the maternal and the fetal blood (umbilical cord blood) directly after birth revealed a deficit of cevitamic acid in the maternal blood and, in the fetal blood, an excess of up to eight times the amount in the mother's blood. In twenty-eight patients with gastric achylia the cevitamic acid values were lower than in normal persons during the same month. Deficient acidity in the stomach is a frequent anomaly in disorders due to vitamin deficiency, such as avitaminosis A, B_1 and B_2, in which the anomaly often disappears on addition of the respective vitamins to the diet. In twenty patients with gastric or duodenal ulcer of pylorogastritis the cevitamic acid value in the serum in April was 0.23 mg. per hundred cubic centimeters; a possible connection is seen between the frequent springtime appearance of symptoms in these patients and the low cevitamic acid values in the blood at that time. In a case of infantile scurvy with cevitamic acid value in the serum of about 0.05 mg. per hundred cubic centimeters in spite of the administration of lemon juice, steady improvement resulted on subcutaneous administration of cevitamic acid.

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